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FOURTEENTH ANNUAL REPORT

OF THE

BOARD

OF

WATER COMMISSIONERS

OF THE

CITY OF SAINT PAUL.

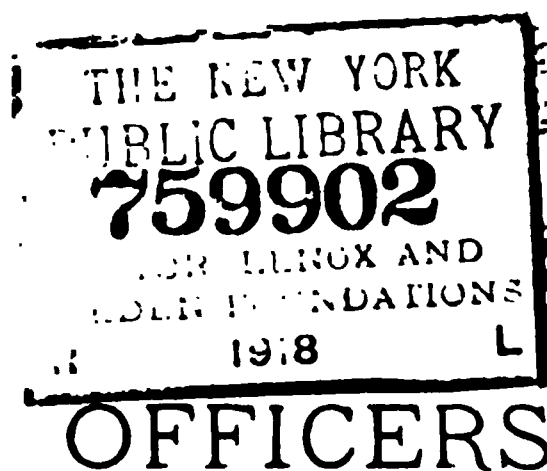
DECEMBER 1, 1895.

ST. PAUL:
J. W. CUNNINGHAM & Co.
1895.

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OF THE
CITY WATER WORKS,

DECEMBER 1, 1895.

BOARD OF WATER COMMISSIONERS.

R. B. C. BEMENT, President. Term expires Jan. 1, 1897.

A. H. LINDEKE. Term expires Jan. 1, 1897.

J. F. HOYT. Term expires Jan. 1, 1900.

H. E. STEVENS. Term expires Jan. 1, 1898.

THOS. GRACE. Term expires Jan. 1, 1899.

JOHN CAULFIELD, Secretary.

JOHN B. OVERTON, Superintendent.

L. W. RUNDLETT, City Engineer and Engineer of the Board.

MARTIN FEIST, Chief Engineer and Engineer of McCarron Lake Station.

JOHN SILVIS, Assistant Engineer of McCarron Lake Station.

H. GEISLER, Gate Keeper and Engineer of Vadnais Lake Station.

A. A. THOMPSON, Assistant Engineer of Vadnais Lake Station.

JACOB ABRESCH, Engineer of Baldwin Lake Station.

OS. DO ERR, Engineer of West St. Paul Station.

FRANK GALLOWAY, Assistant Engineer of West St. Paul Station.

GEO. DOORLEY, Meter Inspector.

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FOURTEENTH ANNUAL REPORT

— OF THE —

BOARD OF WATER COMMISSIONERS

— OF THE —

CITY OF ST. PAUL.

OFFICE OF THE BOARD OF WATER COMMISSIONERS.

ST. PAUL, MINN., December 1, 1895.

To the Honorable the Mayor, and Common Council of the City of St. Paul:

GENTLEMEN:—Herewith we beg to submit for your consideration the fourteenth annual report of your Board of Water Commissioners.

The annual precipitation for the year just passed was very nearly the same as the year previous, viz.: 25.40 inches or four-tenths of one inch less than last year, or about seven percent less than the average rain-fall of this locality, and the rain-fall occurred during the months when least available. There was absolutely no surplus of water this year beyond our impounding capacity, as the level of the water in Baldwin Lake and in Vadnais Lake did not once during the year reach the height where it would waste over, a result which shows conclusively that we have very nearly if not quite reached the capacity in million gallons of daily water supply from our present available water shed.

Early in the season the contract for the completion of the conduit from Otter Lake was let and the work completed, and an additional supply of water amounting to five hundred and fifty million gallons made immediately available by gravity. It has been decided not to call on this supply until absolutely necessary, but to keep it as a reserve.

At our Vadnais Lake station new pumping machinery of increased capacity and economy has been purchased and put into operation. This machinery

was designed and located especially for the purpose of increasing the supply from the artesian wells, the wells were all cut off at a greater depth and connected together and to the suction of the new pumping engine, and the result shows an increase from this well system alone of three million gallons daily of clear, cold and wholesome water, and one ton of coal now pumps over four times as many gallons of water as did the old crude pumping machinery which has been removed.

A vegetable taste and odor in the water for a short term during the extreme hot weather gave us considerable trouble and annoyance, and while from analyses made frequently we found that it contained nothing that was unhealthful, yet it was very annoying to the consumers, and forced us to flush our mains more frequently than ever before. We attribute this unusual and extraordinary condition of the water to the fact that owing to the construction of the abutments for the new bridge over the Great Northern Railway at Como Avenue, our large twenty inch supply main on that avenue had to be cut and plugged on either side of the crossing, leaving long dead ends filled with water with no circulation, to stagnate and decompose, a condition most favorable for the mossy vegetable growth in the pipe, which has always given us more or less trouble in dead ends, and which in this particular case we believe accounted for the annoying condition of the water supplied in July and August. When the new pipe was laid under the bridge and connected with the old main on either side, and the main again put into use, owing to its large size it was very difficult to get sufficient velocity in the pipe by flushing to thoroughly scour the growth off the inside of the pipe. The trouble is now removed and we have no idea such a condition will again arise.

The small mains on Fifth and Sixth streets, at the request of the Fire Department for additional fire hydrants, have been removed and relaid with pipes of larger sizes, also the cement lined sheet iron pipes on West Third, Wabasha and St. Peter streets were removed and replaced by cast iron before the streets were repaved.

Our high service reservoir was given its annual cleansing and found to be in good condition, and rather less sediment than usual found therein.

During the last three months of our year we have been kept on the anxious seat in regard to the large force main supplying the High Service reservoir from the McCarron Lake pumping plant. The County Commissioners let a contract for the grading of Rice street over the swampy sink hole between our pumping station and McCarron Lake, over which our force main is carried on a trestle of piling driven from 20 to 48 feet before reaching hard ground. This line had stood without any settlement ever since it was laid, but through the bad judgment and false economy on the part of the contractor who had the grading, our piling was loaded on one side, instead of equally from both sides, and the whole structure pushed to the North, carrying with it the cast iron water main over two feet, and we were put to a great expense to maintain the same. Work has been stopped for the winter, but we look for more trouble in the spring when work is resumed. A break in this main would not only involve great loss from the emptying of the reservoir, and the flooding and washing out in the vicinity of the break, but would leave the entire high

and the reports of the two succeeding years it is stated that the cost of the "Water Works System" is \$4,123,945.00, which is not correct.

The following table will show the original purchase price paid by the city for the works, and the increase on account of extensions, in distributing mains, new reservoir, conduits, and new water supply at the end of each year ever since.

August 10, 1882, Original purchase.....	\$ 510,000.00
Dec. 1, 1882, Total cost.....	523,860.99
Dec. 1, 1883, " "	679,575.40
Dec. 1, 1884, " "	1,447,494.86
Dec. 1, 1885, " "	1,697,903.71
Dec. 1, 1886, " "	1,859,319.57
Dec. 1, 1887, " "	2,119,027.68
Dec. 1, 1888, " "	2,507,660.71
Dec. 1, 1889, " "	2,864,097.65
Dec. 1, 1890, " "	3,102,203.42
Dec. 1, 1891, " "	3,187,774.00
Dec. 1, 1892, " "	3,348,555.99
Dec. 1, 1893, " "	3,419,059.46
Dec. 1, 1894, " "	3,471,410.12
Dec. 1, 1895, " "	3,579,975.55

From the figures given in the City Comptroller's Reports you will see that for the years 1892, 1893 and 1894 the amount given as the cost of the "Water Works System" was unchanged, though many miles of extensions were laid those years, and the total cost of the works has never reached \$4,123,945, but at the end of this our fiscal year the total cost was some \$543,969.45 less than the amount given in the Comptroller's Report, dated December 31, 1894. This is misleading and incorrect and should be corrected.

R. B. C. BEMENT.

A. H. LINDEKE.

J. F. HOYT.

H. E. STEVENS.

THOMAS GRACE.

Board of Water Commissioners.

on services the past year. The small increase in the revenue from meter consumers is owing to the reduction of meter rents which went into effect over a year ago, and the reduction of meter rates, which went into effect July 1st, 1895.

The miscellaneous water receipts, from builders, hydrant streams, for flushing sewers, skating rinks, etc., filling cisterns and sprinkling streets, were fifteen thousand seven hundred and seventeen dollars and ninety-seven cents (\$15,717.97), a decrease of twenty-five hundred and sixty-six dollars and forty-six cents (\$2,566.46) over the year 1894. There was an increase of six hundred and forty-six dollars and fifteen cents (\$646.15) from builders, and a decrease of four hundred and eight dollars and fifteen cents (\$408.15) from water from miscellaneous use of hydrant streams, two hundred and forty-eight dollars and eighteen cents (\$248.18) for filling cisterns, and twenty-five hundred and fifty-six dollars and thirty-three cents (\$2,556.33) for sprinkling streets.

Extension Account is credited with nineteen hundred and fifteen dollars and sixty cents (\$1,915.60), of which one hundred and sixty-two dollars and ninety cents (\$162.90) was for scrap iron sold to the St. Paul Plow Co. under contract, three hundred and seventy-five dollars and seventy-two cents (\$375.72) was for condemned water pipe sold (authorized by the Board), seven hundred and forty-six dollars and nine cents (\$746.09) for putting in large cast iron services for automatic fire extinguishers and large consumers, five hundred and seventy-four dollars and thirty-four cents (\$574.34) for laying water pipe for the Northern Pacific Railway Co. and the Warren Scharf Asphalt Paving Co., and fifty-six dollars and fifty-five cents (\$56.55) for labor furnished and oil barrels sold.

Construction account is credited with forty-four dollars and seventy cents (\$44.70) of which forty-three dollars and eighty cents (\$43.80) was from the "Soo" Railway Co. for the expense of lowering the creek at the outlet of McCarron Lake near the pumping station, and ninety cents (90-100) for sale of scrap iron.

INTEREST, REPAIRS, EXTENSION, GENERAL MAINTENANCE AND OTHER ACCOUNTS.

One hundred and fourteen thousand and two hundred dollars (\$114,200.00) being the annual interest on the bonded debt (\$2,460,000.00) has been paid from the earnings of the works.

REPAIR ACCOUNT.

Forty-five hundred and forty dollars and fifty cents (\$4,540.50) was paid on this account, a decrease of three hundred and thirty-four dollars and thirty-seven cents (\$334.37); of which thirty-two hundred and ninety-two dollars and sixty cents (\$3,292.60) was on account of hydrants, eight hundred and one dollars and ninety cents (\$801.90), on account of valves and four hundred and forty-six dollars (\$446.00) on account of water mains.

GENERAL MAINTENANCE.

Thirty-nine thousand and six dollars and fourteen cents (\$39,006.14) was paid on this account, a decrease of one hundred and thirty-three dollars and fifty-eight cents (\$133.58). (See table No. 15). The expense of maintaining the four pumping stations and Dale street reservoir was seventeen thousand

valves, street sprinkling hydrants was done by day labor, also work at the various pumping stations, lakes and canals. The pay roll of all officers and employes for the year amounted to fifty-one thousand four hundred and eighty-six dollars and three cents (\$51,486.03).

SINKING FUND.—(See Table No. 12.)

This fund now amounts to three hundred and thirty-six thousand nine hundred and ten dollars and sixty-seven cents (\$336,910.67). Your attention is respectfully called to table No. 12 accompanying this report, showing the sinking fund investments, date of investments, date of certificates, when due, etc.

This account increased the past year eighty-five thousand five hundred and three dollars and sixty cents (\$85,503.60), of which seventy-five thousand dollars (\$75,000) was paid from the earnings of the works, and ten thousand five hundred and three dollars and sixty cents (\$10,503.60) being the interest earnings on the invested funds; the earnings have not been as large as the year previous, owing to the fact that the interest on the tax levy certificates (in which this fund is invested) has been reduced to 5 per cent, and in addition 1 per cent premium has been paid for said certificates.

CONTRACTS.—See Table No. 6.

Contracts have been let during the year amounting to one hundred and eight thousand and ninety-three dollars and thirty-six cents (\$108,093.36), on which eighty-nine thousand three hundred and seventy dollars and twenty-nine cents (\$89,370.29) has been paid, leaving a balance of eighteen thousand seven hundred and twenty-three dollars and seven cents (\$18,723.07) to be paid when contracts are completed. The large increase in this item is partially due to the change in policy on the part of the board in letting all pipe laying by contract instead of doing the same by day labor themselves. On December 1, 1894, there was due on contracts, not then completed, the sum of ten thousand one hundred and fifteen dollars and forty-seven cents (\$10,115.47), on which ten thousand and sixty-five dollars and forty-seven cents (\$10,065.47) has been paid, leaving a balance of fifty dollars (\$50.00) still due.

BONDED DEBT.—(See Table No. 7.)

No increase has been made in the bonded debt during the year. The present bonded debt is two million four hundred and sixty thousand dollars, (\$2,460,000), the annual interest on which is one hundred and fourteen thousand and two hundred dollars, (114,200), and which is paid from the revenue of the works.

FRONTAGE TAX.—(See Table No. 11.)

There has been collected during the year by the County Treasurer one hundred and forty-seven thousand one hundred and seventy-one dollars and forty cents (\$147,171.40), on account of frontage tax. Your attention is called to

were 1,077 special inspections, of which 606 were on high service and 471 on low service. Nearly all of these special inspections were made at the request of consumers for change of rate. We are now making a general inspection of all premises where water is used. This is done every two years. Table No. 20 shows the character and number of hose violations reported to this department the past season. There were only 276 violations reported as against 922 in 1894. This table also shows a comparison of the character and number of hose violations reported for years 1894 and 1895. .

Respectfully submitted.

JOHN CAULFIELD,
Secretary.

TABLE NO. 1.

TRIAL BALANCE, DECEMBER 1, 1895.

ACCOUNT.	DR.	CR.
St. Paul Water Works (original purchase).....	\$510,000.00	
Bond Account.....		\$2,460,000.00
General Water Receipts.....		1,859,976.89
Miscellaneous Water Receipts.....		233,484.88
Connection (Services).....		7,289.61
Extension Account.....	1,897,985.27	
General Maintenance.....	354,466.66 ..	
Repairs	51,111.07	
Meter.....	41,284.92	
Construction	1,120,879.21	
Interest.....	1,167,915 11	
General Water Receipts (Hydrant Account).....		121,663.19
Sinking Fund.....	336,910.67	
Sinking fund earnings.....		33,247.48
Shutting off and turning on water.....		2,176.00
Frontage tax.....		811,384.97
Jno. Wagner, City Treasurer.....	48,670.11	
	\$5,529,223.02	\$5,529,223.02

TABLE NO. 2.

RECEIPTS AND DISBURSEMENTS FROM DEC. 1, 1894, TO DEC. 1, 1895.

RECEIPTS.		
Balance, Dec. 1, 1894.....		\$52,812.16
General water receipts, high service.....	\$70,704.14	
" " " low service	48,788.22	
" " " meters.....	59,754.16	
		\$179,246.52
Miscellaneous receipts, builders.....	\$1,521.03	
" " " flushing sewers and		
hydrant streams.....	403.43	
Miscellaneous receipts, filling cisterns.....	317.01	
" " " sprinkling streets...	13,476.50	
		\$15,717.97
Connections—services.....		14,349.87
Extension.....		1,915.60
Frontage tax.....		147,171.40
Shutting off and turning on water.....		78.00
Construction.....		44.70
Sinking fund.....		1,766.40
Sinking fund earnings.....		12,270.00
		372,560.46
Total receipts.....		\$425,372.62
DISBURSEMENTS.		
General Maintenance—		
Salaries.....	\$19,991.36	
Stationery and printing.....	1,550.43	
Miscellaneous.....	961.18	
Labor.....	5,450.68	
Material.....	10,380.37	
Stable { Feed.....	436.47	
{ Repairs.. ..	235.65	
		\$39,006.14
Connections—		
Labor.....	\$11,456.69	
Pipe.....	3,483.72	
Brass goods and stop boxes.. ..	1,296.07	
Tools and miscellaneous.. ..	438.47	
		16,674.95
Repairs—		
Hydrants. { Labor.....	\$3,172.34	
{ Material.....	120.26	
Valves..... { Labor	549.82	
{ Material... ..	252.08	
Mains—Labor.....	446.00	
		4,540.50
Meters—		
Labor.....	\$2,439.05	
Freight and meters.....	4,583.12	
		7,022.17
Extensions—		
Pipe and special castings.....	\$46,856.99	
Labor and contracts.....	23,628.56	
Tools and repairs of same.....	874.49	
Advertising	24.99	
Fire hydrants.....	2,208.95	
Valves.....	3,410.73	
Lead and hemp packing.....	2,625.88	
Lumber and material.....	1,411.87	
Miscellaneous and building account.....	318.12	
		81,360.58
Construction (new supply)—		
Pipe and special castings.....	\$899.70	
Labor and contracts.....	20,324.17	
Tools and repairs of same.....	32.54	
Lumber and material.....	1,245.97	
Freight.....	8.35	
Engineering and right of way.....	2,066.61	
Miscellaneous and building account.....	47.31	
		24,624.65
Interest.....		114,200.00
Refunded frontage tax		237.12
Sinking fund		87,270.00
Sinking fund earnings.....		1,766.40
Total disbursements.....		376,702.51
Balance		\$48,670.11

TABLE NO. 4.

STATEMENT SHOWING AMOUNT PAID THE CITY TREASURER AND WARRANTS DRAWN AGAINST SAME, FROM DEC. 1, 1894, TO DEC. 1, 1895.

1894				
Dec. 1	Bal. in treasury as per last report			\$52,811
Dec. 1	Cash	\$1,000.00		
Dec. 10	Cash	1,000.00		
Dec. 13	Cash	1,000.00		
Dec. 17	Cash	1,000.00		
Dec. 20	Cash	2,000.00		
Dec. 21	Cash	2,000.00		
Dec. 26	Cash	1,000.00		
1895			\$9,000.00	
Jan. 2	Cash	2,000.00		
Jan. 5	Cash	10,000.00		
Jan. 10	Cash	10,000.00		
Jan. 14	Cash	2,000.00		
Jan. 18	Cash	2,000.00		
Jan. 23	Cash	1,000.00		
Jan. 28	Cash	1,000.00		
Feb. 9	Cash	2,000.00	28,000.00	
Feb. 11	Cash	1,000.00		
Feb. 15	Cash	1,000.00		
Feb. 18	Cash	1,000.00		
Feb. 20	Cash	2,000.00		
Feb. 23	Cash	2,000.00		
Feb. 25	Cash	1,000.00		
Feb. 26	Cash	2,000.00		
Feb. 28	Cash	3,000.00		
March 5	Cash	10,000.00	15,000.00	
March 7	Cash	10,000.00		
March 11	Cash	5,000.00		
March 13	Cash	2,000.00		
March 16	Cash	2,000.00		
March 22	Cash	2,000.00		
March 26	Cash from County Treasurer on account of frontage tax	18,629.76		
March 29	Cash	2,000.00	51,629.76	
April 6	Cash	2,000.00		
April 8	Cash	1,000.00		
April 13	Cash	1,000.00		
April 18	Cash from County Treasurer on account of frontage tax	625.00		
April 19	Cash	1,000.00		
April 20	Cash	3,000.00		
April 25	Cash	1,000.00		
April 29	Cash	2,000.00	11,625.00	
May 4	Cash	1,000.00		
May 7	Cash	1,000.00		
May 8	Cash	1,000.00		
May 9	Cash	3,000.00		
May 16	Cash	1,000.00		
May 18	Cash	1,000.00		
May 23	Cash	1,000.00	9,000.00	
June 3	Cash	1,000.00		
June 4	Cash	1,000.00		
June 7	Cash	1,000.00		
June 12	Cash	1,000.00		
June 17	Cash	1,000.00		
June 21	Cash	1,000.00		
June 24	Cash	1,000.00		
June 28	Cash	1,000.00		
June 29	Cash	2,000.00	10,000.00	
July 5	Cash	5,000.00		
July 8	Cash from County Treasurer on account of frontage tax	15,000.00		
July 9	Cash	10,000.00		
July 11	Cash	5,000.00		

ACCOUNT WITH CITY TREASURER—Concluded.

July 15.....	Cash	\$5,000.00		
July 18.....	Cash	2,000.00		
July 25.....	Cash	1,000.00		
July 25.....	Cash from County Treasurer on account of frontage tax.....	100,000.00		
July 26.....	Cash	1,000.00		
July 30.....	Cash	2,000.00	146,000.00	
Aug. 7. . .	Cash	1,000.00		
Aug. 10.....	Cash	1,000.00		
Aug. 13.....	Cash from County Treasurer on account of frontage tax.....	5,476.29		
Aug. 15.....	Cash	1,000.00		
Aug. 17.....	Cash	1,000.00		
Aug. 19.....	Cash	1,000.00		
Aug. 21. . .	Cash	1,000.00		
Aug. 24.....	Cash	2,000.00		
Aug. 28.....	Cash	2,000.00		
Aug. 31.....	Cash	2,000.00	17,476.29	
Sept. 6. . .	Cash	10,000.00		
Sept. 9.....	Cash	10,000.00		
Sept. 11.....	Cash	2,500.00		
Sept. 13.....	Cash	6,000.00		
Sept. 17.....	Cash	2,500.00		
Sept. 20.....	Cash	2,000.00		
Sept. 26.....	Cash	1,000.00		
Sept. 28.....	Cash	2,000.00		
Sept. 30.....	Cash	1,000.00	37,000.00	
Oct. 7.....	Cash	1,000.00		
Oct. 8.....	Cash	1,000.00		
Oct. 12.....	Cash	1,000.00		
Oct. 15.....	Cash	1,000.00		
Oct. 19.....	Cash	1,000.00		
Oct. 25.....	Cash	1,000.00		
Oct. 30.....	Cash	2,000.00	8,000.00	
Nov. 7. . .	Cash	1,000.00		
Nov. 9.....	Cash	1,000.00		
Nov. 14.....	Cash from County Treasurer on account of frontage tax.....	7,440.35		
Nov. 16.....	Cash	1,000.00		
Nov. 19.....	Cash	1,000.00		
Nov. 22.....	Cash	1,000.00		
Nov. 25.....	Cash	1,000.00		
Nov. 27.....	Cash	2,352.66	15,793.01	
	Total			358,524.06
				\$411,336.22

TABLE NO. 5.

WARRANTS DRAWN ON CITY TREASURER FROM DEC. 1, 1894, TO D
1895.

1894			
Dec. 1 ..	Warrants Nos. 6963 to 6964 inclusive.	\$11,909.30	
Dec. 10..	Warrants Nos. 6965 to 7014 inclusive	9,322.32	
			\$21,331.64
1895			
Jan. 1 ..	Warrant No. 7015	\$4,039.91	
Jan. 11..	Warrants Nos. 7016 to 7059 inclusive.	5,355.36	
Jan. 16..	Warrants Nos. 7060 to 7061 inclusive.	3,176.26	
Jan. 25..	Warrant No. 7062	600.00	
			13,171.53
Feb. 1 ..	Warrant No. 7063.....	\$3,321.89	
Feb. 6 ..	Warrants Nos. 7064 to 7113 inclusive	9,115.44	
			12,437.33
March 1..	Warrant No. 7114	\$3,000.44	
March 2..	Warrants Nos. 7115 to 7123 inclusive	25,295.66	
March 8..	Warrants Nos. 7124 to 7169 inclusive	2,546.51	
			30,842.61
April 1....	Warrant No. 7170	\$3,251.82	
April 9..	Warrants Nos. 7171 to 7214 inclusive	11,215.13	
April 25..	Warrants Nos. 7215 to 7217 inclusive	323.11	
			14,790.06
May 8 ..		\$4,040.00	
May 9....	to 7263 inclusive	27,746.96	
May 21..	to 7276 inclusive	11,238.26	
May 24..	7277.....	1,150.00	
			44,175.22
June 1....	Warrant No. 7278	\$4,427.78	
June 13..	Warrants Nos. 7279 to 7328 inclusive.	24,856.43	
June 21 ..	Warrants Nos. 7329 to 7334 inclusive	1,941.28	
			31,025.49
July 1 ..	Warrant No. 7335	\$4,943.19	
July 2...	Warrants Nos. 7336 to 7340 inclusive	4,091.80	
July 8...	Warrant No. 7341	25,000.00	
July 10..	Warrants Nos. 7342 to 7368 inclusive	3,895.33	
July 16..	Warrants Nos. 7369 to 7384 inclusive.	9,067.73	
			46,997.85
Aug. 1....	Warrant No. 7385	\$4,825.73	
Aug. 9..	Warrants Nos. 7386 to 7442 inclusive.	66,390.54	
Aug. 29..	Warrants Nos. 7443 to 7450 inclusive.	647.87	
			71,874.14
Sept. 2....	Warrant No. 7451	\$4,587.46	
Sept. 13..	Warrants Nos. 7452 to 7507 inclusive.	31,296.84	
			35,884.30
Oct. 1...	Warrant No. 7508	\$4,363.46	
Oct. 7....	Warrant No. 7509	1,525.50	
Oct. 8...	Warrants Nos. 7510 to 7564 inclusive	14,435.90	
Oct. 24..	Warrants Nos. 7569 to 7583 inclusive.	2,128.62	
			22,453.68
Nov. 1...	Warrant No. 7584	\$4,749.55	
Nov. 2...	Warrants Nos. 7585 to 7598 inclusive.	5,648.22	
Nov. 13..	Warrants Nos. 7599 to 7652 inclusive	7,694.49	
			18,092.26
			\$362.1
	Balance		\$48.1

CONTRACTS—Continued.

CONTRACTS MADE PREVIOUS TO DEC. 1, 1894, AND FOR WHICH FINAL SETTLEMENT WAS NOT MADE AT TIME OF LAST ANNUAL REPORT.

Date of Contract	With Whom and for What Purpose.	Amount due Dec. 1, 1894.	Amount Paid.	Amount Due.
1891. July 27...	Andrew Toomey, St. Paul,engine house West St. Paul.....	\$50.00		\$50.00
1894. May 2....	Howard-Harrison Iron Co., Bessemer, Ala., cast iron water pipe.....	395.98	\$395.98	
Sept. 4....	Pioneer Fuel Co.,St Paul,coal and wood	5,245.59	5,245.59	
Sept. 14..	J. F. McCarty, St. Paul, artesian well..	561.90	561 90	
Nov. 2....	P. H. Thornton, St. Paul, conduit bet. Pleasant and Otter Lakes.....	3,862.00	3,862.00	
		\$10,115.47	\$10,065.47	\$50.00

TABLE NO. 7.

BOND ACCOUNT DECEMBER 1, 1895.

Date of Legislative Acts Authorizing Issue of Bonds.	Amount of Bonds Authorized	Date of Bonds Issued	When Due	Amount of Bonds Issued.	Rate Per Cent.	INTEREST PAYABLE.											Total Annual Interest		
						December 1	January 2	February 1	March 2	April 1	May 2	June 1	July 2	August 1	September 1	October 1		November 2	
Feb. 10, 1881	\$600,000	June 1, 1882	30 years	\$350,000	4	\$7,000						\$7,000							\$14,000
Jan. 26, 1883	500,000	Aug. 1, 1883	30 years	150,000	5			\$3,750						\$3,750					7,500
Feb. 21, 1885	800,000	Apr. 1, 1884	25 & 30 yrs.	600,000	5					\$15,000						\$15,000			30,000
Jan. 31, 1887	200,000	Apr. 1, 1885	30 years	400,000	5					10,000						10,000			20,000
Jan. 31, 1887	160,000	May 2, 1887	30 years	200,000	4½						\$4,500							\$4,500	9,000
Mch. 29, 1889	300,000	Mch. 1, 1888	30 years	300,000	4½				\$6,750						\$6,750				13,500
		Jan. 1, 1889	30 years	100,000	4½		\$2,250						\$2,250						4,500
		Jan. 2, 1889	30 years	160,000	4½		3,600						3,600						7,200
		May 1, 1889	30 years	100,000	4½						2,250							2,250	4,500
		May 1, 1890	30 years	100,000	4						2,000							2,000	4,000
	\$2,560,000			\$2,460,000		\$7,000	\$5,850	\$3,750	\$6,750	\$25,000	\$8,750	\$7,000	\$5,850	\$3,750	\$6,750	\$25,000	\$8,750		\$114,200

TABLE NO. 10.

STATEMENT SHOWING AMOUNT DUE THE BOARD OF WATER COMMISSIONERS ON DECEMBER 1, 1895.

From City of St. Paul.			
Water for fire purposes from Dec. 1, 1891, to June 1, 1892.....	\$28,401.58		
Water for fire purposes from June 1, 1892, to Dec. 1, 1892.....	29,229.79		
Water for fire purposes from Dec. 1, 1892, to June 1, 1893.....	30,546.89		
Water for fire purposes from June 1, 1893, to Dec. 1, 1893.....	31,607.77		
Water for fire purposes from Dec. 1, 1893, to June 1, 1894.....	31,773.12		
Water for fire purposes from June 1, 1894, to Dec. 1, 1894.....	32,307.00		
Water for fire purposes from Dec. 1, 1894, to June 1, 1895.....	32,700.16		
Water for fire purposes from June 1, 1895, to Dec. 1, 1895.....	33,204.95		
		\$249,771.21	
Premiums received and retained by the City on the \$160,000 of bonds issued in Jan., 1889, to redeem the bonds of the old St. Paul Water Co. of like amount, assumed by the City at the time of the purchase of the works		5,393.77	
Re-laying of water mains caused by change of grade			
On Mt. Airy between Valley and Warren	\$248.12		
On Fairview between Jackson and Mt. Airy...	134.25		
On E. Sixth, between Maria and Hoffman....	399.75		
On E. Sixth, between Broadway and Olive....	674.37		
On Flandrau, at Harvester.....	65.00		
Changing main at Como avenue bridge.....	760.58		
		2,282.07	
For putting in public fountains.....	43.70		
Amount due for hydrant stream.....	44.00		
Balance.....1894, \$340.00			
For water for park fountains all 1895, 815.00	1,155.00		
		1,242.70	
Repairing water mains broken by sewer contractors (claims filed with city comptroller)..			\$258,689.75
Balance frontage tax assessment for '84-5-6-7-8	\$1,229.42		114.14
Balance frontage tax assessment for 1889.....	240.56		
Balance frontage tax assessment for 1890.....	2,228.46		
Balance frontage tax assessment for 1891.....	1,953.80		
Balance frontage tax assessment for 1892.....	2,202.99		
Balance frontage tax assessment for 1893.....	1,697.98		
Balance frontage tax assessment for 1894.....	35,384.73		
Balance frontage tax assessment for 1895.....	125,374.26		
		\$170,312.22	
From Builders.....		150.00	
From service connections.....		397.98	
Street sprinkling for 1895.....		18,407.53	
			189,267.73
Total.....			\$448,071.62

TABLE NO. 11.
FRONTAGE TAX ACCOUNT COLLECTIONS ABATEMENTS BALANCE DUE DECEMBER 1, 1895.

RECEIPTS.	1884-5-6-7 and 1888	1889	1890	1891	1892	1893	1894	1895	TOTAL.
March 26, 1895.....	\$5.00	\$5.00	\$61.26	\$674.46	\$4,063.04	\$11,151.71	\$2,669.29	.....	\$18,629.76
April 18, 1895.....	.....	.....	.....	.....	625.00	.....	.....	.....	625.00
July 8, 1895.....	.....	.....	.....	.....	.....	.....	15,000.00	.....	15,000.00
July 25, 1895.....	20.84	30.25	164.48	245.44	779.17	19,041.99	79,717.83	.....	100,000.00
August 13, 1895.....	.....	.....	.....	.....	750.00	.....	4,726.29	.....	5,476.29
November 14, 1895.....	.....	19.96	123.50	399.81	1,251.31	1,785.19	3,860.58	.....	7,440.35
Total receipts.....	25.84	55.21	349.24	1,319.71	7,468.52	31,978.89	105,973.99	.....	147,171.40
Amount due Dec. 1, 1894, as per last report.....	1,235.26	295.77	2,577.72	3,273.51	9,671.51	33,676.87	141,358.72	.....	192,109.36
Amount of 1895 assessment collected in 1896.....	.....	.....	.....	.....	.....	.....	.....	125,374.26	\$44,937.96 125,374.26
Amount due Dec. 1, 1895...	\$1,229.42	\$240.56	\$2,228.48	\$1,953.80	\$2,202.99	\$1,697.98	\$35,384.73	\$125,374.26	\$170,312.22

TABLE NO. 12.

SINKING FUND INVESTMENTS IN CITY TAX LEVY CERTIFICATES.

Date of Investment.	Date of Certificates.	When Due.	Certificate Numbers.	No. of Certificates.	Interest.	Amount of Certificates.
Feb. 20, 1893..	Jan. 15, 1895..	June 15, 1896	174 to 183 incl.	10 5		5,000.00
Mch. 15, 1895	Jan. 15, 1895 ..	June 15, 1896	224 to 226 incl.	3 5		1,500.00
May 15, 1895..	Jan. 15, 1895 ..	June 15, 1896	228 to 230 incl.	3 5		1,500.00
May 16, 1895	Mch. 15, 1895..	July 1				
June 17, 1895..	June 15, 1895 ..	June 1				
July 8, 1895..	Mch. 15, 1895..	July 1				
July 8, 1895.	June 15, 1895 ..	June 1				
July 17, 1895 ..	July 15, 1895...	Aug. 1				
Oct. 16, 1893 ..	July 15, 1895...	Aug. 1				

Amount uninvested... ..\$140,910.67

TABLE NO 13.

Pay Roll for Year Include Salaries of Officers, En- gineers, Firemen, In- spectors and Laborers.			Salaries of Engineers, Firemen and Keepers at the Various stations.					
Month	No. of Men.	Total Amt. of Pay Roll	M'Carron Lake Station	Vadnais Lake Station	Baldwin Lake Station.	West St. Paul Station.	Reacr- Vair.	TOTAL.
1894								
Nov ...	172	\$4,909.30	\$350.00	\$100.00	\$185.00	\$110.00	\$25.00	\$750.00
Dec . .	90	4,039.91	302.00	56.67	165.00	110.00	25.00	668.67
1895								
Jan.. .	67	3,321.89	300.00	50.00	50.00	110.00	25.00	535.00
Feb. .	66	3,000.44	300.00	50.00	50.00	110.00	25.00	535.00
March	68	3,251.82	300.00	50.00	50.00	110.00	25.00	535.00
April.	93	4,040.00	300.00	50.00	50.00	110.00	25.00	535.00
May...	101	4,427.78	300.00	50.00	95.00	110.00	55.00	610.00
June .	104	4,943.19	300.00	50.00	165.00	110.00	40.00	665.00
July..	97	4,325.73	300.00	91.66	165.00	110.00	40.00	706.66
Aug. .	105	4,587.48	300.00	100.00	165.00	110.00	40.00	715.00
Sept ..	107	5,888.96	300.00	100.00	165.00	110.00	40.00	715.00
Oct .	107	4,749.55	300.00	100.00	165.00	110.00	40.00	715.00
	1,167	\$51,486.03	\$3,652.00	\$848.33	\$1,450.00	\$1,320.00	\$405.00	\$7,675.38

TABLE NO. 14.

THE FOLLOWING TABLE SHOWS THE NUMBER OF APPLICATIONS MADE FOR WATER SERVICES ANNUALLY FROM 1869 TO DATE.

Year.	High Service.	Low Service.	Total.
1869		34	
1870.....		321	
1871.....		250	
1872.....		164	
1873.....		131	
1874.....		153	
1875.....		95	
1876.....		85	
1877.....		65	
1878.....		50	
1879.....		180	
1880.....		167	
1881.....		164	
1882.....		264	
1883.....		301	2426
1884.....	164	336	500
1885.....	644	363	1009
1886.....	639	369	1008
1887.....	747	325	1072
1888.....	812	406	1218
1889.....	1327	491	1818
1890.....	1071	336	1407
1891.....	811	264	1075
1892.....	671	210	881
1893.....	474	151	625
1894.....	363	139	502
1895.....	390	311	701
	8113	6129	14242

TABLE NO. 15.

PUMPING PLANTS.

EXPENSE MAINTAINING THE FOUR (4) PUMPING STATIONS AND RESERVOIR.

Station.	Salaries.	Fuel.	Waste and Machine Oil.	Repairs.	Kerosene Oil.	Total.
McCarron L. St'n	\$3,652.00	\$5,034.79	\$243.57	\$269.09	\$5.20	\$9,204.65
Baldwin Lake "	1,450.00	2,524.46	23.77	45.19	27.08	4,070.50
Vadnais Lake St'n	848.33	1,105.00	47.50	31.58	11.64	2,044.05
West St. Paul St'n	1,320.00	299.50	5.27	26.47	9.08	1,660.32
Reservoir.....	405.00					405.00
	\$7,675.33	\$8,963.75	\$320.11	\$372.33	\$53.00	\$17,384.52

TABLE NO. 16.

METERS IN SERVICE DECEMBER 1, 1894

KIND OF METERS.	SIZE.								TOTAL.
	1/2	3/4	1	1 1/2	2	3	4		
Worthington (improved)	112	112	35	43	7			315	
Worthington (old style)	7	16	9	8	3			42	
Union (rotary)	74	26	14	8				125	
Nash	10	2						12	
Crown	71	16	24	31	10			154	
Crown "A A"	97		5	2				104	
Empire	15	19	45	33	10			123	
Empire "A"	5	1	2					8	
Gem						1	1	2	
Thomson	18	5	1					24	
Thomson "B"	1	45	14	1	2			67	
Hersey	30	34	26	21	12	2		125	
Frost		1						1	
Trident	4	1						5	
Westinghouse			1		1			2	
Total	16	492	278	154	114	44	9	1109	

TABLE NO. 17.

SHUTTING OFF AND TURNING ON WATER FROM DEC. 1, 1894, TO DEC. 1, 1895.

	High Service.	Low Service.	Total.
Shut off for repairs	276	285	561
Shut off for non-payment	209	208	417
Shut off for violation of rules			
Shut off for vacant premises	619	489	1,108
Total	1,104	982	2,086
Turned on old services	1,119	974	2,093
Turned on new services	365	131	496
Turned on for builders	11	10	21
Total	1,495	1,115	2,610

Total services shut off and turned on for year ending	December 1, 1896	4,696
	December 1, 1894	4,932
	December 1, 1893	4,477
	December 1, 1892	4,470
	December 1, 1891	4,743
	December 1, 1890	3,919
	December 1, 1889	3,978
	December 1, 1888	2,832
	December 1, 1887	2,541
	December 1, 1886	2,324
	December 1, 1885	2,311
	December 1, 1884	1,014

SIZES OF METERS---Continued.

KIND OF METERS.	Size in Inches.	Property of City.			Private Property.			Grand Total of Meters In Service.	Grand Total of Meters In Shop.	Grand Total of all Meters.
		In Service.	At Work Shop.	Total.	In Service.	At Work Shop.	Total.			
Hersey Disc.....	1½	.....	2	2	.....	.....	.....	.....	2	2
Frost	¾	1	.....	.....	.....	.....	.....	1	.....	1
Sport.....	¾	.....	1	1	.....	.....	.....	.....	1	1
Trident.....	1	.....	1	1	.....	.....	.....	.....	1	1
Trident.....	¾	1	1	2	.....	.....	.....	1	1	2
Trident.....	¾	4	5	9	.....	.....	.....	4	5	9
Westinghouse.....	2	1	.....	1	.....	.....	.....	1	.....	1
Westinghouse.....	1½	.....	1	1	.....	.....	.....	.....	1	1
Westinghouse.....	1	1	4	5	.....	.....	.....	1	4	5
Westinghouse.....	¾	.....	2	2	.....	.....	.....	.....	2	2
.....	.....	1,063	74	1,137	46	.....	46	1,109	74	1183

PUMPING STATIONS AND RESERVOIR—Continued.

VADNAIS LAKE STATION.

Year.	Salaries.	Fuel.	Machine Oil and Waste.	Repairs.	Kerosene Oil.	Total.	Water Pumped.		Fuel, Coal, Etc.	
							Annually.	Daily.	Annually.	Daily.
1891....	\$1,100.00	\$1,081.68	\$50.75	\$197.12	\$6.36	\$2,435.91	207,750,000		246,800	
1892....	1,020.00	1,905.25	73.71	102.19	25.90	3,127.05				
1893....	600.00			21.35		621.35				
1894....	912.50	1,508.99	21.06	216.75	20.60	2,679.90	337,160,000		624,387	
1895....	848.33	1,105.00	47.50	31.58	11.64	2,044.05	237,043,000		550,000	

WEST ST. PAUL STATION.

Year.	Salaries.	Fuel.	Machine Oil and Waste.	Repairs.	Kerosene Oil.	Total.	Water Pumped.		Fuel, Coal, Etc.	
							Annually.	Daily.	Annually.	Daily.
1893....	\$1,237.75	\$589.63	\$29.72	\$23.50	\$15.10	\$1,895.70	10,015,722	27,440	209,043	571
1894....	1,320.00	328.96	2.88	28.83	14.20	1,694.87	9,123,480	24,990	169,220	463
1895....	1,320.00	299.50	5.27	26.47	9.08	1,660.32	10,520,640	28,848	174,600	479

RESERVOIR.

Year	Salaries.	Year.	Salaries.
1891.....	\$405.00	1894.....	\$405.00
1892.....	405.00	1895.....	405.00
1893.....	405.00		

TABLE NO. 20.
HOSE VIOLATIONS, 1895.

Violation.	High.	Low.	Total.
Hose, 1, violation.....	136	87	223
Hose, 2 violations.....	5	1	6
Hose, 3 violations.....	1	.....	1
Reel, 6 to 9 P. M., 1 violation.....	34	.....	34
Reel, 6 to 9 P. M., 2 violations.....	6	.....	6
Reel, 6 to 9 P. M., 3 violations.....	2	.....	2
Reel, 6 to 9 P. M., 4 violations.....	2	.....	2
Hose all day, 1 violation.....	1	.....	1
Hose all day, 2 violations.....	1	.....	1
Total.....	188	88	276

COMPARATIVE STATEMENT OF HOSE VIOLATIONS FOR 1894 AND 1895.

Violation.	1894.			1895.		
	High.	Low.	Total.	High.	Low.	Total.
Hose, 1 violation.....	200	129	329	136	87	223
Hose, 2 violations.....	28	16	44	5	1	6
Hose, 3 violations.....	13	7	20	1	.....	1
Hose, 4 violations.....	2	3	5	.....	.....	.....
Hose, 5 violations.....	1	2	3	.....	.....	.....
Hose, 7 violations.....	2	1	3	.....	.....	.....
Reel, 6 to 9 P. M., 1 violation....	185	50	235	34	.....	34
Reel, 6 to 9 P. M., 2 violations...	22	14	36	6	.....	6
Reel, 6 to 9 P. M., 3 violations...	6	2	8	2	.....	2
Reel, 6 to 9 P. M., 4 violations...	2	1	3	2	.....	2
Reel, 6 to 9 P. M., 7 violations...	.....	1	1	.....	.....	.....
Hose all day, 1 violation.....	162	34	196	1	.....	1
Hose all day, 2 violations.	23	9	32	1	.....	1
Hose all day, 3 violations.....	2	4	6	.....	.....	.....
Hose all day, 4 violations.....	.....	1	1	.....	.....	.....
Total.....	648	274	922	188	88	276

TABLE NO. 21.

STATEMENT SHOWING THE NUMBER OF MILES OF PIPE LAID ANNUALLY TO DATE, EXPENSE OF SAME, FRONTAGE TAX, ETC.

	MAINS LAID.		Expenditure on account of laying mains	Construction outside of city	Annual maintenance	Number of applications	Annual receipts from consumers	Increase.	Frontage tax receipts	Number of hydrants in use	Frontage tax assessment	Number of yrs frontage tax has been paid incl. 1894 tax	Years more to pay on basis 10 years
	Miles	Feet											
To August 10, 1882	23	1662				2007							
From Aug. 10, '82, to Dec. 1, '82	3793		^a \$12,300.44	\$1,566.80	\$1,674.58	118				188			
From Dec. 1, '82, to Dec. 1, '83	44807		61,003.97	100,021.19	6,854.30	301				198			
From Dec. 1, '83, to Dec. 1, '84	161220		157,149.31	609,686.93	11,473.84	500				236			
From Dec. 1, '84, to Dec. 1, '85	232583		207,546.90	40,144.36	b 19,275.58	1009			\$12,269.90	315	\$12,852.76		
From Dec. 1, '85, to Dec. 1, '86	183334		138,694.54	19,657.46	17,976.64	1008			19,538.26	491	20,590.06		
From Dec. 1, '86, to Dec. 1, '87	202207		225,443.70	32,975.47	22,806.58	1072	\$106,635.23	12,976.71	32,495.91	673	33,787.68		
From Dec. 1, '87, to Dec. 1, '88	283392		288,018.19	97,736.31	23,799.81	1218	112,720.01	6,084.18	43,062.60	864	46,388.88		
From Dec. 1, '88, to Dec. 1, '89	354963		257,680.58	80,690.69	26,122.69	1818	124,920.90	12,200.89	55,066.01	1134	58,669.10		
From Dec. 1, '89, to Dec. 1, '90	264085		211,013.64	26,026.29	c 36,082.75	1407	138,913.61	13,992.71	73,079.70	1471	76,706.21		
From Dec. 1, '90, to Dec. 1, '91	53696		46,029.69	38,937.07	38,473.82	1075	159,561.29	20,648.48	88,987.80	1748	99,680.96		
From Dec. 1, '91, to Dec. 1, '92	14928		c 118,343.20	41,327.25	35,349.12	881	171,164.69	11,603.40	112,082.57	1813	117,947.95		
From Dec. 1, '92, to Dec. 1, '93	81946		63,325.15	4,590.46	36,404.84	625	177,595.21	6,430.62	107,899.11	1968	128,846.45		
From Dec. 1, '93, to Dec. 1, '94	6646		42,287.17	6,198.62	d 39,139.72	502	178,967.32	1,372.11	112,115.05	2067	135,336.46		
From Dec. 1, '94, to Dec. 1, '95	813		f 81,360.58	24,624.65	39,006.14	701	179,246.52	279.20	147,171.40	2131	143,001.73		
Relaid large mains in 1895	241	2315	\$1,928,277.06	\$1,124,185.55	\$354,440.41	14242			\$813,767.51	2200	125,374.26		
Less relaid and mains abandoned	7	3212					Less amount refunded....		2,383.34				
Net amount mains.....	233	4382							\$811,384.17				

^a This includes relaying 16-inch pipe on Lafayette avenue near Trout Brook, of regrading street, an expense of \$4,677 97.

^b Pumping station established for high service in fall of 1884.

^c Pumping stations established for well plant at Vadnais lake, also Rice lakes.

^d Pumping station established for high service in West St. Paul in Fall of 1892.

^e This includes laying the 20-inch force main to reservoir.

^f This includes laying 9234 feet of 30-inch supply main on Dale street from reservoir to Dale and Front, at an expense of \$38,365.78.

LIST OF VOUCHERS—Continued.

JANUARY, 1895.

No. of Voucher	NAME.	CLAIM.	AMOUNT.
7015	John Caulfield, secretary.....	Pay roll for December, 1894.....	\$4,039.91
7016	Henry Bucher.....	Wood at Baldwin Lake.....	22.00
7017	John Wagener, city treasurer.....	Interest due Feb. 1, 1895.....	3,750.00
7018	D. L. Bell.....	Cement.....	15.40
7019	Robinson & Cary Co.....	Pipe and pipe fittings.....	13.66
7020	J. Arth, for H. J. Heimbach.....	Wood for Baldwin Lake.....	19.94
7021	Charles Lehman.....	Wood for Baldwin Lake.....	77.00
7022	Walter P. Jones.....	Wood for Baldwin Lake.....	22.00
7023	Charles Rehbein.....	Wood for Baldwin Lake.....	30.94
7024	Dr. Carl Wirth.....	Professional services, injured men.....	56.00
7025	H. M. Smyth Printing Co.....	Blank books.....	16.75
7026	P. N. Lindquist.....	Horse shoeing.....	8.00
7027	Adam Decker & Co.....	Hardware for pump house.....	1.60
7028	Allen & Co.....	Livery.....	13.00
7029	Est. Jas. Gilfillan.....	Rent of storage lot.....	25.00
7030	Northwestern Shot and Lead Works.....	Lead pipe.....	139.07
7031	Charles Friend & Son.....	Harness fittings, etc.....	4.95
7032	Fielding & Shepley.....	Relaying pavement.....	20.81
7033	The Western Supply Co.....	Lead pipe.....	16.70
7034	Jefferson & Kasson.....	Lumber.....	23.35
7035	Richard Price.....	Veterinary services.....	2.00
7036	Albrecht Bros.....	Repairing buffalo robe.....	5.00
7037	National Meter Co.....	Meters.....	526.80
7038	St Paul Fire and Marine Ins. Co.....	Insurance on stable.....	17.00
7039	Eshelman & Iten.....	Horse shoeing.....	2.50
7040	The N. W. Telephone Co.....	Rent of office telephones.....	6.00
7041	Pioneer Press Co.....	Job printing.....	19.25
7042	P. H. Kelly Mercantile Co.....	Oil and candles.....	20.02
7043	Taylor Craig Corporation.....	Carpenter work.....	17.75
7044	Brown, Treacy & Co.....	Stationery, etc.....	16.25
7045	H. P. Rugg & Co.....	Pipe fittings.....	17.27
7046	N. W. Copper and Brass Works.....	Repairing valve.....	.50
7047	Tierney & Co.....	Feed.....	2.45
7048	Cornplanter Oil Co.....	Engine oil.....	11.66
7049	Union Brass and Metal Mfg. Co.....	Repairing gate spindles.....	3.00
7050	Roberts Goss Co.....	Machine work.....	4.15
7051	Robert Seeger.....	Gasoline.....	.80
7052	Pioneer Fuel Co.....	Fuel Est. No. 4.....	274.77
7053	D. Ramaley & Son.....	Job printing.....	19.50
7054	Thos. Fitzpatrick.....	Book rack for meter book.....	1.50
7055	Farwell, Ozmun, Kirk & Co.....	Tools, etc.....	8.03
7056	J. G. Duggan.....	Blacksmithing.....	20.15
7057	Mitsch Wagon and Carriage Co.....	Blacksmithing.....	28.80
7058	Minnesota Engine Works.....	Machine work.....	1.90
7059	John Caulfield, secretary.....	Cash advanced, postage, etc.....	52.14
7060	Alfred Gustafson.....	Land for conduit, Otter to Pleasant Lake.....	800.00
7061	P. H. Thornton.....	Est. No. 2, Otter Lake conduit.....	2,376.28
7062	Joseph Pariseau.....	Land for right-of-way.....	600.00
	Total.....		\$13,171.55

LIST OF VOUCHERS—Continued.

SEPTEMBER, 1895.

No. of Voucher	NAME.	CLAIM.	AMOUNT.
7451	John Wagener, city treasurer.....	Pay roll for August, 1895.....	\$4,587.46
7452	John Wagener, city treasurer.....	Interest due Oct. 1, 1895.....	25,000.00
7453	South Park Foundry and Machine Co.....	Est. No. 7, water gates.....	148.00
7454	The Western Supply Co.....	Est. No. 1 and final, lead pipe.....	713.75
7455	C. W. Peterson.....	Rent of boat.....	19.50
7456	F. W. Luley & Son.....	Tallow.....	2.00
7457	The McGill Printing Co.....	Books.....	8.50
7458	Northwestern Shot and Lead Wks.....	Lead pipe.....	35.88
7459	Jameson, Hevener & Co.....	Oats.....	57.07
7460	Anthony P. Smith.....	Est. No. 2, special castings.....	190.00
7461	Mathew Taylor.....	Forms for testing cement.....	2.25
7462	J. G. Duggan.....	Sharpening Tools.....	2.75
7463	Theo. Vondlac.....	Hauling coal.....	34.78
7464	Allen & Co.....	Livery.....	40.50
7465	Pioneer Press Co.....	Vouchers and bills.....	35.75
7466	Martin Feist.....	Lunch.....	3.50
7467	Mitsch Wagon and Carriage Co..	Sharpening tools.....	28.58
7468	John Martin Lumber Co.....	Lumber.....	6.05
7469	P. H. Kelly Mercantile Co.....	Oil, brooms, etc.....	44.72
7470	Pioneer Fuel Co.....	Est. No. 11, fuel.....	376.26
7471	D. Ramaley & Son.....	Printing and postals.....	16.50
7472	Brown, Treacy & Co.....	Stationery.....	7.08
7473	Geo. J. Mitsch & Co.....	Supplies.....	3.65
7474	Dispatch Printing Co.....	Advertising.....	5.78
7475	Robert W. Hunt & Co.....	Est. No. 5, testing pipe.....	9.27
7476	P. N. Lindquist.....	Horse shoeing.....	8.00
7477	Dan Cashill.....	Horse shoeing.....	8.00
7478	Estate James Gilfillan.....	Rent of storage lot.....	25.00
7479	N. W. Telephone Ex. Co.....	Rent of telephones.....	7.25
7480	D. L. Bell.....	Cement.....	14.90
7481	P. Doherty.....	Est. No. 4 and final, pipe laying, Dale street.....	176.85
7482	Charles Friend & Son.....	Leather, repair harness, etc.....	6.65
7483	J. D. Moran Mfg. and Construction Co.....	Est. No. 1, manholes, etc.....	204.00
7484	J. D. Moran Mfg. and Construction Co.....	Est. No. 1 and final, services on W. 5th.....	452.00
7485	South Park Foundry and Machine Co.....	Est. No. 8, water gates.....	60.80
7486	James Sheely.....	Est. No. 4, drayage.....	98.13
7487	P. H. Thornton.....	Est. No. 1, fencing right-of-way....	978.44
7488	Million & Young.....	Est. No. 4, div. 2 and 3, pipe laying.....	994.26
7489	Cornplanter Oil Co.....	Gasoline.....	5.40
7490	Schroeder & Dickinson.....	Repairing chair.....	.75
7491	Goodvear Rubber Co.....	Rubber boots.....	17.60
7492	The Western Supply Co.....	Pipe fittings, etc.....	7.08
7493	N. W. Wheel and Foundry Co.....	Stop box covers, etc.....	10.12
7494	Standard Oil Co.....	Oil.....	12.24
7495	St. Paul Gas Light Co.....	Coal.....	46.13
7496	The Crane and Ordway Co.....	Valves, pipe fittings, etc.....	59.33
7497	Union Brass and Metal Mfg. Co..	Bronze screws and nuts.....	19.80
7498	Robinson & Cary Co.....	Pipe fittings, etc.....	67.29
7499	Farwell, Ozmun, Kirk & Co.....	Powder and hardware.....	21.31
7500	N. W. Shot and Lead Works.....	Lead pipe.....	16.07
7501	St. Paul Foundry Co.....	Manhole covers, etc.....	61.08
7502	J. Strane.....	Hauling coal.....	11.16
7503	Schickle, Harrison & Howard Iron Co.....	Est. No. 4, pipe.....	713.28
7504	F. A. Leyde.....	Rent of engine.....	4.00
7505	Pioneer Fuel Co.....	Est. No. 12, fuel.....	5.85
7506	Portland Stone Co.....	Tiles.....	8.00
7507	National Meter Co.....	Meters.....	405.00
	Total.....		\$35,884.30

LIST OF VOUCHERS—Continued.

OCTOBER—Continued.

No. of Voucher	NAME.	CLAIM.	AMOUNT.
7567	St. Paul Plow Co.....	Est. No. 5, specials.....	\$18.68
7568	Jno. Caulfield, secretary	Cash advanced per voucher.....	50.40
7569	St. Paul Plow Co.....	Est. No. 2 and final, specialsVad. L	181.30
7570	The Menomonie Pressed Brick Co.	Brick.....	56.10
7571	South Park Foundry & Mach. Co	Gates for intake chamber, Otter Lake.....	86 00
7572	South Park Foundry & Mach. Co	Repairing hydrant, valves, etc.....	27.60
7573	Shickle, Harrison & Howard Iron Co.....	Est. No. 5 and final, iron pipe.....	1,181.49
7574	Wedelstaedt & Carman... ..	Printing 500 postals.....	1.50
7575	Johnson Bros. & Loomis.....	Desk and repairing old desks.....	50.00
7576	Jameson, Hevener & Co.....	Hay.....	16.61
7577	P. N. Lindquist.....	Horse shoeing.....	8.00
7578	James Shiely.....	Est. No. 5 and final, drayage.....	218.22
7579	Warren-Scharf Asphalt Pav. Co...	Repairing paving.....	7.14
7580	Thomson Meter Co.....	Meter gears, etc.....	13.35
7581	Roberts-Goss Co.....	Machine work.....	22.01
7582	J. J. McCafferty, atty for Arthur Foussard.....	Injuries.....	300.00
7583	St. Paul Printing Co.....	Printing affidavits, etc.....	9.50
	Total.....		\$22,453.68

LIST OF VOUCHERS—Continued.

NOVEMBER, 1795—Continued.

No. of Voucher	NAME.	CLAIM.	AMOUNT.
7643	Million & Young.....	Est. No. 6, pipe laying.....	\$514.20
7644	J. D. Moran Mng. and Con. Co.....	Est. No. 3 and final.....	881.50
7645	Hersey Manfg. Co.....	Meter fittings.....	166.60
7646	Wedelstaedt & Carmen.....	Envelopes.....	3.00
7647	Pioneer Fuel Co.....	Est. No. 3, fuel.....	82.15
7648	Theophile Vondiac.....	Est. No. 4, hauling coal Vad. l.	9.60
7649	John Caulfield, secretary.....	Cash advanced.....	17.58
7650	Mahle & Sutmar.....	Repairing buggy, etc.....	1.65
7651	Hennessy & Cox	Repairing paving, etc.....	156.60
7652	E. P. Allis & Co.....	Est. No. 1, engine for well plant at Vadnais Lake..... ..	3,750.00
	Total.....		\$18,092.26
	Grand Total		\$362,666.11

REPAIRS OF MAINS.

There have been ten leaks and breaks in mains the past year, one caused by settling of sewer trench, five leaks in joints, one caused by frost, two caused by sand holes in casting, and one caused by plug being blown out.

On account of paving next year it will be necessary to relay mains on the following streets: Four inch pipe on Sixth street, from Wacouta to east line of Broadway; to relay with eight inch pipe the old six inch cement pipe on Broadway from Ninth to Grove; and the four inch pipe on Eighth from Kittson to Wabasha to be relaid with eight inch pipe.

The grading of Rice street across the force main west of McCarron Lake pumping station has imperiled the safety of the high service supply main and is likely to be the cause of more trouble next spring when the contractor resumes the grading.

FIRE HYDRANTS.

Our fire hydrants are at present in excellent condition. Sixty-nine additional fire hydrants have been placed this year, making a total of 2200 now in use. The repairs on same for the past year were as follows:

REPAIRS OF HYDRANTS.

There have been forty-seven leaks and breaks in fire hydrants, of which one was caused by a broken rod, one by broken ring valve, one by broken ring valve key in rod, twenty valves cut by stones, twelve loose valve nuts, two loose ring valve nuts, two caused by defective seat washers, one by runaway team, and seven had to be taken out to repair waste vent.

VALVES AND VALVE REPAIRS.

There were sixty-eight new valves placed this year, making a total of 1954 now in use.

There have been seventy-one leaks in stuffing boxes, three loose glands in stuffing boxes, seventeen defective spindles, two leaky flange joints, eighteen by rust in gland of stuffing boxes, one broken spreader, four by rust in pinion wheel, and one by iron spreader in disk.

SPRINKLING STAND PIPES.

There have been twenty-one new sprinkling stand pipes placed this year, making a total in all of 278.

There have been thirty-nine leaks and breaks in same, as follows: Twenty-one caused by leak in rod valves, and eighteen pipes opened by frost.

SERVICE PIPES.

Seven hundred and one service pipes were put in this year, making a total of 14,242.

The leaks in service pipes have been as follows: Twenty-six leaks and breaks in service pipes and stops, five have been caused by broken or defective joints; sixteen by broken or defective stops; two by defective pipe; one by defective goose neck, and two in temporary mains.

Sixty-six old stops without checks were taken out and replaced with new stops. All stops taken out were rivet bottoms.

One hundred and seventy-two service pipes were reported frozen this year, at the office, out of a total of 14,242, of which one hundred and sixteen were frozen inside of property line or at sink, two frozen in area ways, and fifty-four frozen in street outside of property line.

Respectfully submitted,

J. B. OVERTON,

Superintendent.

PIPE LAID ON LOW SERVICE DURING THE YEAR 1895.

DATE.	STREET.	FROM STREET TO STREET.	6 Inch.	12 Inch.
Dec. 24, 1894..	Washington....	Sixth to Seventh.....		204
Jan. 21, 1895..	West Fifth.....	East of Seventh.....	123	
Jan. 26, 1895..	Exchange.. ..	Fourth to Seventh.....	258	
June 14, 1895..	Daly.....	Crossing Jefferson.....	64	
June 14, 1895..	Jefferson	Daly to Arbor.....		639
June 14, 1895..	Arbor.....	Jefferson to Grace.....	595	
June 20, 1895..	Fifth.....	East of Third.....	104	
June 29, 1895..	Plato.....	West of S. Robert main	18	
July 6, 1895..	Ninth.....	Crossing St. Peter.....	42	
Aug. 6, 1895..	Exchange.....	Crossing Wabasha.....	44	
Sept. 9, 1895..	Wakouta.....	South of Third.....	118	
Sept. 12, 1895..	Rosabel	Third and south of same.....	161	
Sept. 17, 1895..	Winnifred	W. of Bellows to W. L. of L. 15, B. 200	48	
Total.....			1575	843

Total 6-inch pipe.....1575
Total 12-inch pipe..... 843
Total2418 feet.

PIPE LAID ON WEST SIDE HIGH SERVICE DURING THE YEAR 1895.

DATE.	STREET.	FROM STREET TO STREET.	6 Inch.
October 25.	Curtis.....	Oakdale to 250 feet E. of Woodbury.....	1,437
October 25.	Oakdale.....	At Curtis.....	19
Total.....			1,456

Total 6 inch pipe.....1,456 feet.

Total mileage laid this year on High and Low service and High Service West St. Paul, 6 miles and 807 feet.

WATER MAINS ON LOW SERVICE.—Continued.

STREET.	FROM STREET TO STREET.	↓ Inch. 6 Inch.	8 Inch.	12 Inch.	16 Inch.	20 Inch.	24 Inch.	30 Inch.	36 Inch.
		N59							
		2106							
		909							
		1569							
		1765	2123			1890			
			847		6648				
			2075						
			545						
		290				1274			
			692						
			51						
			2624						
		557							
			897						
			2081						
		783	118		1736				
		2420							
			1030						
		1047			1236				
			411						
			316						
			2350						
			1022						
		550							
			1215						
			5540						
		683							
			6965						
			2138						

WATER MAINS ON LOW SERVICE.—Continued.

STREET.	FROM STREET TO STREET.	4 Inch.	6 Inch.	8 Inch.	12 Inch.	16 Inch.	20 Inch.	24 Inch.	30 Inch.	36 Inch.
Winslow....	Isabel to Prospect Terrace.....		745							
Yankee.....	Seventh to Dousman.....	678								
Main old line.....	Fauquier to Lake Phalen.....					6000		7024		
	Total.....	42560	195305	2287	47748	38078	8302	8765	16436	18

	Feet.
Total 4-inch pipe.....	42,560
Total 6-inch pipe.....	195,305
Total 8-inch pipe.....	2,287
Total 12-inch pipe.....	47,748
Total 16-inch pipe.....	38,078
Total 20-inch pipe.....	8,302
Total 24-inch pipe.....	8,765
Total 30-inch pipe.....	16,436
Total 36-inch pipe.....	18
Total.....	359,499 feet, or 68 miles, 459 feet.

LOCATION, SIZE AND NUMBER OF FEET OF WATER MAINS LAID ON
HIGH SERVICE TO DECEMBER 1, 1895.

STREET.	FROM STREET TO STREET.	4 Inch.	6 Inch.	12 Inch.	16 Inch.	20 Inch.	24 Inch.	30 Inch.	36 Inch.
Arlington..	Greenbrier to Payne.....	650							
Arundel.....	Summit to Lafond.....	2553							
Ashland.....	Western to Oxford.....		7203						
Aurora.....	Robert to Chatsworth...		7814						
Arcade.....	Third to Rose.....		1070	5382					
Astoria.....	St. Anth'y to Milwaukee.....		275						
Argyle.....	Front to Van Slyke.....	370	831						
Albemarle..	Atwater to Front.....	1293							
Arch.....	100 feet W. of Columbia to Jackson.....		1725						
Atlantic.....	Fauquier to Stillwater...		1785						
Atwater...	Rice to Sylvan.....		1142						
Agate.....	Cortland to York.....		1739						
Avon.....	Dayton to Martin.....	1381							
Bates.....	Murray to Hastings.....		376	3035					
Beech.....	Seventh to Duluth.....		3738						
Blair.....	Western to Fairview.....		4610						
Broadway..	Thirteenth to Mt. Airy...		407		533				
Brewster...	University to Como.....		1076						
Burr.....	C., St. P., M. & O. R. R. to Brainard.....		3498						
Bradford...	Hampden to Endicott....		819						
Bradley....	Maryland to 236 feet of..		256						
Burgess....	At Dale and at Como.....		114						
Bayless av.	Raymond to Langford P.				2935				
Bayless Pl.	Raymond to Bayless av.	902							
Burns.....	Mound to Griffith.....		2753						
Blake.....	Raymond to Langford P. P. E.....		282		186				
Beacon	University to Shields.....	594							
Buffalo.....	Capitol to Genesee....		631						
Canada.....	University to Valley.....		290						
Capitol.....	Mississippi to Fairview..		6866						
Carroll.....	Rice to Cleveland.....		13202						
Conway...	Cypress to Maria.....		3067						
Cedar.....	Summit to Como		2486						
Central av.	E. line of Central Park to Rice.....	557	1254						
Cent'l P. D. E. & W...	Summit to Central av....	1209							
Charles.....	Rice to Prior.....		10171						
Churchill...	Front to Van Slyke.....	1103	1263						
College.....	Rice to Third.....		1165						
Como Boul	E. line of lot 4, block 5 to N. line of lot 5, block 1, Warrendale.....		666						
Como av...	Park to Dale.....				469	6555			
Chelton ...	Prior to Tatum.....		559						
Cherry.....	267 feet W. of Hoffman to Maria.....	267	565						
Cook.....	Forrest to Rice.....		6123						
Case.....	Forrest to Terrace.....		345	6551					
Claghorn...	Lafond to Van Buren....		628						
Cypress....	North of Euclid.....	45							
Cromwell..	Manvel to Cudworth.....		1599						
Cudworth..	Bayless to Rustis.....		985						
Clark.....	Whitall to Case.....		1308						
Cross.....	Argyle to Lexington.....		966						
Cambridge	Princeton to Lincoln....		1060						
County Rd.	Langford to Dooley.....				256				
Crocus Pl.	Goodrich to Fairmount..	1314							
Chatsw'th.	Evergreen to Van Slyke..		983						
Cleveland..	Lincoln to University....			3411	3313				
Cortland...	Capitol to Maryland.....		252		4600				
Cayuga.....	Mississippi to Cortland..		1630						
Carter.....	W. line L. 31, B. 40, to County road....		1886						
Dale.....	Fairmount to Reservoir..	4800		2110	5280	1453	14500	9234	1560
Dayton.....	Summit to Cleveland.....		11578	4675					

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WATER MAINS, HIGH SERVICE.—Continued.

STREET.	FROM STREET TO STREET.	4 Inch.	6 Inch.	12 Inch.	16 Inch.	20 Inch.	24 Inch.	30 Inch.	36 Inch.
Jessie	Case to Maryland.....		2635						
Kent.....	Portland to Carroll.....	2201							
Kenw'd Pk	St. Albans around said								
	Park		767						
Knapp.....	Langford Ave to Ray-								
	mond Ave.....		1838						
Keston	Dooley to Doswell.....		924						
Laura.....	Waltham to University..		1211						
Laurel.....	Nina to Fisk.....		8297						
Lawton.....	Grand to Selby.....		480						
Long.....	Crossing of Bradford.....		115						
Lincoln.....	Oakland to Finn.....		8390						
Louis.....	Nelson to Fuller.....		2122						
Linden.....	Mt. Airy to Arch.....		696						
Lafond	Rice to Milton.....		7340						
Lyndhurst									
E. and W.	University to Feronia.....		1850						
Lexington.	Grand to Van Slyke.....				3818				
Langford,									
P. P. E..	Bayless to Knapp.....		415		427				
Langford,									
P. P. W..	Bayless to Gordon.....		181	670					
Langf ave..	Scudder to Dooley.....			1236	838				
Lookout P.	Arkwright to Westmins-								
	ter.....		447						
Litchfield..	Rice to Sylvan.....		1142						
Leslie.....	Victoria to Chatsworth.		1256						
Lawson.....	Earl to Rice.....		7505						
Linwood P	Osceola to Grotto.....		745						
Lyton P....	Rice to Sylvan.....		1142						
L. Como &									
Phalen av	At Dale street			23					
Mackubin..	Summit to Edmund.....		5708						
Maple.....	Hastings to Seventh..		2660	811					
Margaret..	Gotzian to Greenbrier....		4782						
Martin	Central to Milton		7739						
Maria.....	River to North.....		5481						
Marshall...	Western to 300 ft. W. of								
	Cleveland		2640	8164					
Mendota...	Hudson to Fauquier		655	3286					
Mt. Airy....	L'Orient to Robert.....		2024						
Maryland..	Dale to Arcade.....		3855	22					
Marion.....	University to Lafond.....		1639						
Minnehaha	Duluth to Tatum.....		4364	7473					
Mound	Hastings to 335 ft. W.								
	of Earl.....		1298	1536					
Milwaukee	Merriam Park to Astoria		570						
Manvel.....	Robbins to Raymond.....		1142						
Magnolia..	Cypress to 120 ft. E. of								
	Mississippi.		5698						
Mulberry...	Third to Sixth.....	365							
Milford.....	Rice to Woodbridge.....		655						
McLean.....	Maria to Earl.....		752						
Minne'p'lis	At Dale.....			18					
M' Menemy	Case to Jessamine.....			1652					
Mississippi	Great Northern Ry. to								
	Cayuga.....		1136						
Manitoba..	Rice to Sylvan.....		1139						
Macalester	Summit to Princeton.....		1885						
Mt. Ida.....	De Sota to Rivoli.....		535						
Nelson	Summit to Western.....		2422						
Nina.....	Summit to Selby.		800						
North.....	Maria to Seventh.....		1035						
Nourse.....	Gordon to N. P. Ry.....		392						
Oakland....	Ramsey to Summit ave..		3662						
Olive.....	Olmsted to Pennsylvania		1057						
Oakley.....	Lynnhurst W. to Prior..		451						
Osceola.....	Pleasant to Chatsworth		3709						
Otsego.	Lafayette to Mt. Ida.....		791						
Park Place	Park Drive S. W.....	574							

WATER MAINS ON HIGH SERVICE.—Continued.

STREET.	FROM STREET TO STREET.	4 Inch.	6 Inch.	12 Inch.	16 Inch.	20 Inch.	24 Inch.	30 Inch.	36 Inch.
Van Slyke..	Chatsworth to Lexington.....		1488						
Wabasha...	Summit to Park av.....	537	842						
Western.....	Summit to Como.....			1775	6285				
Williams....	Olive to Mississippi.....		857						
Waltham...	Laura to Prior.....	959							
Wayzata....	At Albemarle.....		90						
Wilder.....	Iglehart to St. Ant.....		1388						
Whitall.....	Payne to Clark.....		2301						
Walker.....	Hewitt to Great Northern Ry.....	807							
Wesley.....	Pascal to Fry.....	394	621						
Workhouse	Around workhouse.....		1043						
Wheeler St..	Bayless to Eustis C.....			1012					
Westmins-ter.....	Lookout Place to Case.....		384						
Wheeler av.	Univ'ty to Shields.....		588						
Wo'dbridge	Atwater to Front.....		1297						
Winnipeg...	Rice to Sylvan.....		1142						
Wells.....	Edgerton to Arcade.....		1804						
Wells, S. side.....	From E. to W. end of retaining wall.....	1130							
White Bear.	Seventh to Ames.....			1992					
York.....	Forrest to Cortla'd.....		5782						
	Total.....	37123	536411	118449	87188	36178	15495	9234	1560

	FEET.
Total 4 inch pipe.....	37,123
Total 6 inch pipe.....	536,411
Total 12 inch pipe.....	118,449
Total 16 inch pipe.....	87,188
Total 20 inch pipe.....	36,178
Total 24 inch pipe.....	15,495
Total 30 inch pipe.....	9,234
Total 36 inch pipe.....	1,560

Total..... 841,638 feet or 159 miles 2118 feet

LIST OF HYDRANTS.

No.	LOCATION.	SERVICE.	DOUBLE OR SINGLE STREAMER.	SIZE OF PIPE.	PRESSURE
1	Woodward and Monroe, s. e. cor.....	Low.....	Single.....	4	
2	Grove and Lafayette, n. w. cor.....	Low.....	Single.....	6	
3	Westminster and Waverly, n. w. cor.....	Low.....	Single.....	6	
4	Westminster, 400 feet north of Waverly	Low.....	Single.....	6	
5	Grove and Olive, n. e. cor.....	Low.....	Single.....	6	
6	John and Somerset, n. w. cor.....	Low.....	Single.....	4	
7	Olive and Somerset, n. w. cor.....	Low.....	Single.....	4	
8	Pine and Thirteenth, n. w. cor.....	Low.....	Single.....	6	
9	Thirteenth and Mississippi, s. e. cor	Low	Single.....	6	
10	Grove and Mississippi, n. w. cor	Low.....	Single.....	20	
11	Van Slyke P. and Pine, s. w. cor	Low.....	Single.....	4	
12	Canada and Grove, s. w. cor.....	Low.....	Single.....	6	
13	Canada and Spruce, s. w. cor.....	Low.....	Single.....	6	
14	Grove, in Middle of block, between Canada and Temperance.....	Low	Single.....	20	
15	Jackson and Grove, n. e. cor	Low.....	Single.....	6	
16	Robert and Twelfth, s. e. cor.....	Low.....	Single.....	6	
17	Robert and Eleventh, n. e. cor.....	Low.....	Single.....	6	
18	Eleventh and Minnesota, n. e. cor	Low.....	Single.....	6	
19	Eleventh and Cedar, n. e. cor.....	Low	Single.....	6	
20	College and Wabasha, s. w. cor.....	Low.....	Single.....	6	
21	Wabasha and Tenth, n. w. cor.....	Low.....	Single.....	6	
22	St. Peter and Tenth, s. w. cor	Low.....	Single.....	6	
23	St. Peter and College, n. w. cor.....	High.....	Single	6	
24	St. Peter and Summit, n. w. cor	High.....	Single.....	6	
25	Tenth and College, s. w. cor	Low.....	Single.....	6	
26	Tenth, between St. Peter and Fort.....	Low.....	Single.....	20	
27	St. Peter and Exchange, s. w. cor.....	Low.....	Single.....	6	
28	Wabasha and Exchange, n. w. cor.....	Low.....	Single.....	6	
29	St. Peter and Ninth, s. w. cor.....	Low.....	Single.....	6	
30	Wabasha and Ninth, s. w. cor.....	Low.....	Single.....	6	
31	Ninth and Jackson, n. e. cor.....	Low.....	Single.....	6	
32	Ninth and Sibley, n. w. cor.....	Low.....	Single.....	6	
33	Ninth and Canada, n. e. cor.....	Low.....	Single.....	6	
34	Ninth and Pine, s. w. cor.....	Low.....	Single.....	6	
35	Ninth and John, s. w. cor.....	Low.....	Single.....	6	
36	Ninth and Locust, s. w. cor.....	Low.....	Single.....	6	
37	Eighth and Neill, n. e. cor.....	Low.....	Single.....	4	
38	Fifth and Locust, n. e. cor.....	Low.....	Single.....	6	
39	Eighth and Olive, n. w. cor.....	Low.....	Single.....	4	
40	Broadway and Eighth, n. w. cor.....	Low.....	Single.....	6	
41	Eighth and Wacouta, n. e. cor.....	Low.....	Single.....	4	
42	Jackson and Eighth, n. e. cor.....	Low.....	Double	12	
43	Robert and Eighth, s. e. cor.....	Low.....	Single.....	6	
44	Burr and Partridge, s. e. cor	Low.....	Single.....	6	
45	Burr and Hopkins, s. e. cor.....	Low.....	Single.....	6	
46	DeSoto and Hopkins, n. e. cor.....	Low.....	Single.....	6	
47	Third and Smith ave, n. e. cor	Low.....	Single.....	6	
48	Third and Pleasant, n. e. cor.....	Low.....	Single.....	6	
49	College and Third, n. e. cor.....	High.....	Single.....	6	
50	Exchange and Sherman, s. e. cor.....	Low.....	Single.....	4	
51	Walnut and Exchange, n. e. cor.....	Low.....	Single.....	4	
52	Sherman and Seventh, s. e. cor.....	Low.....	Single.....	6	
53	Seventh and Walnut, s. e. cor.....	Low.....	Double	20	
54	Chestnut and Seventh, n. e. cor.....	Low.....	Single.....	6	
55	Fort and Third, n. w. cor.....	Low.....	Single.....	20	
56	Fourth and Seventh, s. e. cor.....	Low.....	Single.....	16	
57	Seventh and Exchange, s. w. cor.....	Low.....	Double	16	
58	Seventh and Fifth, s. w. cor	Low.....	Double	16	
59	Seventh and Franklin, s. w. cor	Low.....	Double	16	
60	Seventh and Sixth, s. e. cor.....	Low.....	Double	16	
61	Seventh and St. Peter, n. e. cor.....	Low.....	Double	16	
62	Seventh and Wabasha, n. w. cor	Low.....	Double	16	
63	Cedar and Seventh, n. w. cor	Low.....	Single.....	12	
64	Seventh and Minnesota, n. w. cor.....	Low.....	Single.....	16	
65	Seventh and Robert, n. w. cor.....	Low	Double	16	
66	Jackson and Seventh, n. e. cor	Low.....	Double	12	

LIST OF HYDRANTS.—Continued.

No.	LOCATION.	SERVICE.	DOUBLE OR SINGLE STEAMER.	SIZE OF PIPE.	PRESSURE AT HYDRANT.
274	Iglehart and Western, n. w. cor.....	High	Single	6	36
275	Marshall and Western, n. w. cor.....	High	Single	6	32
276	Dayton and Western, n. e. cor.....	High	Single	12	31
277	Western and Selby, n. w. cor.....	High	Single	12	32
278	Western and Laurel, n. w. cor.....	High	Single	12	31
279	Western and Ashland, n. w. cor.....	High	Single	12	33
280	Western and Holly, n. w. cor.....	High	Single	12	34
281	Western and Portland, n. w. cor.....	High	Single	12	34
282	Summit and Portland.....	High	Single	12	34
283	Summit and Arundel, n. e. cor.....	High	Single	12	31
284	Summit and Mackubin, n. e. cor.....	High	Single	12	30
285	Summit and Kent, n. e. cor.....	High	Single	12	36
286	Summit and Oakland.....	High	Single	12	35
287	Holly and Dale, n. e. cor.....	High	Single	6	36
288	Holly and Kent, n. e. cor.....	High	Single	6	34
289	Holly and Mackubin, n. e. cor.....	High	Single	6	32
290	Holly and Arundel, n. e. cor.....	High	Single	6	33
291	Ashland and Arundel, n. e. cor.....	High	Single	6	32
292	Ashland and Mackubin, n. e. cor.....	High	Single	6	30
293	Ashland and Kent, n. e. cor.....	High	Single	6	33
294	Ashland and Dale, n. e. cor.....	High	Single	6	37
295	Laurel and Dale, n. e. cor.....	High	Single	6	35
296	Laurel and Kent, n. e. cor.....	High	Single	6	31
297	Laurel and Mackubin, n. w. cor.....	High	Single	6	30
298	Laurel and Arundel, n. e. cor.....	High	Single	6	30
299	Dayton and Dale, n. e. cor.....	High	Single	12	30
300	Dayton and Kent, n. e. cor.....	High	Single	12	28
301	Dayton and Mackubin, n. e. cor.....	High	Single	12	29
302	Dayton and Arundel, n. e. cor.....	High	Single	12	33
303	Dayton and Virginia, n. e. cor.....	High	Single	12	30
304	Dayton and Farrington, n. e. cor.....	High	Single	12	30
305	Dayton, bet on.....	High	Single	12	31
306	.....	High	Single	6	42
307	.....	High	Single	6	37
308	.....	High	Single	6	37
309	.....	High	Single	6	33
310	..... W. cor.....	High	Single	6	31
311	..... E. cor.....	High	Single	6	33
312	..... V. cor.....	High	Single	6	32
313	..... E. S. W. cor.....	High	Single	6	31
314	.....	High	Single	6	32
315	.....	High	Single	6	32
316	..... N. Ry ..	Low	Single	6	30
317	..... E. cor.....	Low	Single	6	39
318	.....	Low	Single	4	37
319	..... E. cor.....	Low	Single	4	33
320	..... n. e. cor.....	Low	Single	6	33
321	..... E. cor.....	Low	Single	4	34
322	..... W. cor.....	Low	Single	6	35
323	..... E. cor.....	Low	Single	6	34
324	..... S. W. cor.....	Low	Single	6	34
325	..... S. E. cor.....	Low	Single	10	36
326	..... S. W. cor.....	Low	Single	6	32
327	Twelf	Low	Single	20	32
328	Twelf	Low	Single	20	29
329	Twelf	Low	Single	20	27
330	.....	Low	Single	6	23
331	..... W. cor.....	Low	Single	6	62
332	.....	High	Single	6	32
333	.....	High	Single	6	32
334	.....	High	Single	6	30
335	Portli	High	Single	6	32
336	Portland and Mackubin, n. e. cor.....	High	Single	6	29
337	Portland and	High	Single	6	34
338	Portland and Dale, n. e. cor.....	High	Single	6	34
339	Selby and Arundel, n. e. cor.....	High	Single	6	33
340	Selby and Mackubin, n. e. cor.....	High	Single	6	29
341	Selby and Kent, n. e. cor.....	High	Single	6	29
342	Selby and Dale, n. e. cor.....	High	Single	6	31

LIST OF HYDRANTS.—Continued.

No.	LOCATION	SERVICE	DOUBLE OR SINGLE STRAKKE.	SIZE OF PIPE.	PRESSURE AT HYDRANT.
1	cor.....	High.....	Single.....	6	37
1	cor.....	High.....	Single.....	6	44
1	or.....	High.....	Single.....	6	45
1	or.....	High.....	Single.....	6	45
1	w. cor.....	High.....	Single.....	6	44
1	s. cor.....	High.....	Single.....	6	36
1	.....	Low.....	Single.....	6	36
1	.....	Low.....	Single.....	6	33
1	.....	Low.....	Single.....	6	31
1	.....	High.....	Double.....	6	33
1	May.....	Low.....	Single.....	4	50
1	.....	High.....	Single.....	4	49
1	.....	Low.....	Double.....	6	49
1	.....	High.....	Single.....	6	34
1	e. cor.....	High.....	Single.....	6	32
1	.....	High.....	Single.....	6	49
1	.....	Low.....	Double.....	12	59
1	.....	High.....	Single.....	6	59
1	.....	High.....	Single.....	6	41
1	.....	High.....	Single.....	6	55
1	.....	Low.....	Single.....	12	67
1	artie.....	Low.....	Double.....	12	68
1	.....	Low.....	Double.....	12	69
1	or.....	Low.....	Single.....	12	66
1	.....	Low.....	Single.....	12	64
1	ce, s. w. cor.....	Low.....	Single.....	6	21
1	O. Ry.....	High.....	Single.....	6	56
1	.....	High.....	Single.....	6	57
1	cor.....	High.....	Single.....	6	48
1	.....	High.....	Single.....	6	61
1	cor.....	High.....	Single.....	6	48
1	.....	Low.....	Single.....	4	46
1	.....	Low.....	Single.....	4	49
1	.....	High.....	Single.....	6	54
1	w. cor.....	High.....	Single.....	6	62
1	.....	High.....	Single.....	6	63
1	.....	Low.....	Single.....	6	22
1	.....	Low.....	Single.....	6	41
1	.....	High.....	Single.....	16	33
1	.....	Low.....	Single.....	6	30
1	.....	Low.....	Single.....	6	30
1	or.....	High.....	Single.....	6	31
1	or.....	High.....	Single.....	6	32
1	.....	Low.....	Single.....	6	37
1	.....	Low.....	Single.....	6	39
1	.....	High.....	Single.....	6	27
1	Short Line.....	Low.....	Single.....	6	40
1	.....	Low.....	Single.....	6	22
1	cor.....	Low.....	Single.....	6	18
1	.....	Low.....	Single.....	6	45
1	.....	High.....	Single.....	12	38
1	cor.....	High.....	Single.....	12	36
1	or.....	High.....	Single.....	12	36
1836	Gordon and Dooley, s. w. cor.....	High.....	Single.....	6	32
1837	Carter and Gordon.....	High.....	Single.....	6	30
1838	Carter and.....	High.....	Single.....	6	20
1839	Carter, 400.....	High.....	Single.....	6	19
1840	Carter and.....	High.....	Single.....	6	27
1841	Keston and Dooley, n. w. cor.....	High.....	Single.....	6	21
1842	Keston and Doswell, s. w. cor.....	High.....	Single.....	6	25
1843	Selby and Saratoga, n. w. cor.....	High.....	Single.....	6	24
1844	Selby and.....	High.....	Single.....	6	26
1845	Selby and.....	High.....	Single.....	6	26
1846	Selby and.....	High.....	Single.....	6	27
1847	Selby and.....	High.....	Single.....	6	26
1848	L'Orient a.....	Low.....	Single.....	6	34
1849	Hope and Francis, s. w. cor.....	High.....	Single.....	6	43
1850	Selby and Griggs, n. e. cor.....	High.....	Single.....	6	27

LIST OF HYDRANTS.—Continued.

LIST OF HYDRANTS.—Continued.

LIST OF HYDRANTS.—Continued.

No.	LOCATION.	SERVICE.	DOUBLE OR SINGLE STEAMER.	SIZE OF PIPE.	PRESSURE AT HYDRANT.
2186	Wakouta, bet. Fourth and Fifth, west side..	Low	D. S.....	12	55
2187	Broadway and Sixth, n. e. cor.....	Low	D. S.....	16	48
2188	Robert, bet. Sixth and Seventh, east side....	Low	D. S.....	6	45
2189	Robert, bet. Fourth and Fifth, west side.....	Low	D. S.....	6	45
2190	Jackson, bet. Third and Fourth, east side. ..	Low	D. S.....	12	52
2191	Grand and Cambridge, n. e. cor.....	High.....	Single	6	30
2192	Grand and Baldwin, n. e. cor.....	High.....	Single	6	31
2193	Curtis and Mt. Hope, n. e. cor.....	W. S., High	Single	6	76
2194	Curtis and Harvard, n. w. cor.....	W. S., High	Single	6	74
2195	Curtis and Woodbury, n. w. cor.....	W. S., High	Single	6	74
2196	Curtis, 250 feet east of Woodbury, n. side...	W. S., High	Single	6	75
2197	Fourth and St. Peter, s. e. cor.....	Low	Double.....	6	32
2198	St. Peter, bet. Fourth and Fifth, west side...	Low	Double.....	6	32
2199	St. Peter, bet. Fifth and Sixth, east side.....	Low	Double.....	6	33
2200	Fifth, bet. Wabasha and St. Peter, n. side....	Low	Double.....	6	33

Number of fire hydrants placed this year on low service.....	34
Number of fire hydrants placed this year on high service.....	31
Number of fire hydrants placed this year on West Side high service.....	4

Total number placed this year 69

Total number placed to date on low service	759
Total number placed to date on high service.....	1,353
Total number placed to date on high service, West Side.....	88

Grand Total..... 2,200

Of which 122 on low and 5 on high service are double steamers.

There are also 4 hydrants on the private property of the Northwestern Cordage Co., and 11 on the W. A. Wood Harvester Co.'s private property, and 3 at the N. P. shops, 1 at Yoerg's brewery; they are all duplicates of our standard and can be used in case of fire.

LIST OF STREET SPRINKLING HYDRANTS —Continued,

No.	LOCATION.	MEASUREMENT OF VALVE FROM HYDRANT.	NAME OF HYDRANT.
64	Reaney and Seventh.....	8 feet.....	Stand pipe
65	Earl and Seventh.....	6 feet.....	Stand pipe
66	Locust and Ninth.....	11 feet.....	Stand pipe
67	Walnut and Summit.....	52 feet.....	Stand pipe
68	Ninth and Fort.....	8 feet.....	Stand pipe
69	Grove and Canada.....	5 feet.....	Stand pipe
70	Mendota and Seventh....	9 feet.....	Stand pipe
71	Jackson and Fourteenth.....	9 feet.....	Stand pipe
72	John and Fourth.....	6 feet.....	Stand pipe
73	Maple and Conway.....	8 feet.....	Stand pipe
74	Farrington and Carroll.....	20 feet.....	Stand pipe
75	Topping and Como.....		
76	Viola and Grant.....	26 feet.....	Stand pipe
77	Capitol and Western.....		
78	Acker and Mississippi.....	6 feet.....	Stand pipe
79	Payne and Minnehaha.....	11 feet.....	Stand pipe
80	Fairfield and South Wabasha.....	8½ feet.....	Stand pipe
81	Audubon and Seventh.....	8 feet.....	Stand pipe
82	Rice and Como.....	8 feet.....	Stand pipe
83	Rice and G. N. Ry.	7 feet.....	Stand pipe
84	Williams and Pine.....	22 feet.....	Stand pipe
85	Olmsted and Olive.....	33 feet.....	Stand pipe
86	Neill and Fifth.....	12 feet west..... 36 feet south.....	Stand pipe
87	Canada and University.....	23 feet.....	Stand pipe
88	Warren and Valley.....	4 feet east..... 32 feet west.....	Stand pipe
89	Gaultier and University.....	7 feet east..... 34 feet south.....	Stand pipe
90	Virginia and University.....	3 feet east..... 33 feet south.....	Stand pipe
91	Farrington and Nelson.....	26 feet west.....	Stand pipe
92	Oakland and Floral.....	6 feet.....	Stand pipe
93	Mackubin and Iglehart.....	8 feet.....	Stand pipe
94	Acker and Elk.....	6 feet.....	Stand pipe
95	Summit and Cedar.....	35 feet.....	Stand pipe
96	Iglehart and St. Peter.....	28 feet.....	Stand pipe
97	Ninth and Jackson.....	29 feet north.....	Stand pipe
98	Sherman and Exchange.....	7 feet.....	Stand pipe
99	Summit Place and Iglehart.....	22 feet.....	Stand pipe
100	Summit Place and Martin.....	28 feet.....	Stand pipe
101	Jay and Fuller.....	8 feet.....	Stand pipe
102	Dale and University.....	8 feet.....	Stand pipe
103	St. Albans and Hague.....	7 feet.....	Stand pipe
104	Hoffman and Sixth.....	8 feet.....	Stand pipe
105	Hoffman and Cherry.....	10 feet.....	Stand pipe
106	River and Hoffman.....	10 feet.....	Stand pipe
107	University and Snelling.....	31 feet.....	Stand pipe
108	Carroll and Dale.....	5 feet.....	Stand pipe
109	St. Anthony and St. Albans.....	34 feet.....	Stand pipe
110	Dale and Selby.....	9 feet.....	Stand pipe
111	Farrington and Sherburne.....	7 feet.....	Stand pipe
112	Mackubin and Fuller.....	5 feet.....	Stand pipe
113	Mackubin and St. Anthony.....	9 feet.....	Stand pipe
114	Harrison and Garfield.....	10 feet.....	Stand pipe
115	Charles and Western.....	10 feet.....	Stand pipe
116	Marion and Charles.....	8 feet.....	Stand pipe
117	Granite and Mississippi.....	9 feet.....	Stand pipe
118	Sixth and Broadway.....	7 feet.....	Stand pipe
119	Minnehaha and Burr.....	13 feet north..... 26 feet east.....	Stand pipe
120	Bedford and Decatur.....	30 feet.....	Stand pipe
121	Burr and Hopkins.....	6 feet.....	Stand pipe
122	Maple and Hudson.....	7 feet.....	Stand pipe
123	Goodhue and Richmond.....	32 feet.....	Stand pipe
124	Duke and Seventh.....	7 feet.....	Stand pipe
125	Earl and Minnehaha.....	7 feet.....	Stand pipe
126	Arcade and Reaney.....	7 feet.....	Stand pipe

LIST OF STREET SPRINKLING HYDRA

241 Cross and Van Dyke.....	7 feet.....	Stand pipe
242 Front and Colne.....	7 feet.....	Stand pipe
243 Avon and Osceola.....	9 feet east.....	Stand pipe
	36 feet south.....	
244 Avon and St Anthony.....	6 feet.....	Stand pipe
245 Wilder and.....	36 feet.....	Stand pipe
246 Bunker and.....	25 feet.....	Stand pipe
247.....	8 feet.....	Stand pipe
248.....	8 feet.....	Stand pipe
249.....	8 feet.....	Stand pipe
250.....	6 feet.....	Stand pipe
251.....	7 feet.....	Stand pipe
252.....	34 feet.....	Stand pipe
253.....	7 feet.....	Stand pipe

LOCATION OF VALVES (LOW SERVICE).—Continued.

STREET.	L.
Fifth	West line of
Fifth	West line of
Fifth	West line of
Fifth	West line of
Fifth	East and w
Fifth	East line of
Fifth	East line of
Fifth	East and w
Fifth	West line of
Fifth	East and w
Fifth	East line of
Fifth	West line of
Fifth	West line of
Fifth	South line of
Fifth	East line of
Fifth	East line of
Fifth	East line of
Fifth	East line of
Fort	North line of
Fort	Blowoff no
Fort	On H., sout
Fort	On H., sout
Fort	On M. and
Fort	On H., bet.
Fourth	East of St.
Fourth	East and w
Fourth	B. O. at Nel
Fourth	West line of
Fourth	East and w
Fourth	West line of
Fourth	West line of
Fourth	East and w
Fourth	East line of
Fourth	East and w
Fourth	West line of
Fourth	West line of
Fourth	East line of
Fourteenth	East and w
Fourteenth	East line of
Franklin	North line of
Franklin	North line of
Franklin	North line of
Franklin	North line of
Franklin	North line of
Franklin	North and s
Franklin	South line of
Fred	East line of
Forbes	West line of
Forbes	East and w
Forbes	West line of
Garfield	North line of
Garfield	North line of
Goodhue	East and w
Goodhue	East line of
Goodrich	East and w
	M. and B.
Grace	South line of
Grove	West line of
Grove	West line at
	issippi, M. l
Grove	On H., west
Grove	East line of
Glencoe	East line of
Glencoe	West line of
George	West line of
George	West line of
George	East line of

LOCATION OF VALVES (LOW SERVICE).—Continued.

STREET.	LOCATION.	3 Inch.
Sixth.....	East line of Exchange . . .	
Sixth	East and west line of Fort.	
Sixth.....	North line of Smith.	
Smith	East and west line of Seventh	
Smith.....	North line of Forbes	
Smith. . . .	North line of Ramsey.	
Smith. . . .	North line of Sherman	
Smith. . . .	North line of Walnut.	
Smith.	North and south line of Third. . .	
Smith. . . .	North line of Sixth	
Somerset.....	East line of Pine.	
Somerset. . .	West line of John.....	

LOCATION OF VALVES (LOW SERVICE).—Continued.

Σ

Number of valves laid this year.	16
Total number of valves on low service	709

LOCATION OF VALVES (HIGH SERVICE).

STREET	
Arundel.....	North line of
Arundel.....	South line of
Arundel.....	North line of
Arundel.....	North line of
Arundel.....	North line of
Arundel.....	North line of
Ashland.....	West line of
Ashland.....	East line of
Ashland.....	East and w
Ashland.....	East line of
Ashland.....	East and w
Ashland.....	East line of
Aurora.....	West line of
Aurora.....	East line of
Aurora.....	West line of
Aurora.....	East and w
Aurora.....	East line of
Aurora.....	East and w
Aurora.....	West line of
Aurora.....	South line of
Arcade.....	North line of
Arcade.....	North and s
Arcade.....	North line of
Arcade.....	South line of
Arcade.....	North line of
Arcade.....	North and s
Arcade.....	South line of
Arcade.....	North line of
Astoria.....	North line of
Arch.....	West line of
Arch.....	East line of
Atlantic.....	North and s
Atlantic.....	South line of
Atwater.....	East line of
Agate.....	East line of
Agate.....	North line of
Agate.....	South line of
Avon.....	South line of
Avon.....	North line of
Avon.....	North line of
Avon.....	North line of
Arlington.....	East line of
Argyle.....	North line of
Albemarle.....	South line of
Albemarle.....	South line of
Bates Ave.....	North line of
Bates Ave.....	South line of
Beech.....	East and w
Beech.....	East line of
Beech.....	East line of
Beech.....	South line of
Blair.....	West line of
Blair.....	East line of
Blair.....	East line of
Blair.....	East line of
Blair.....	East line of
Broadway.....	B. O., north
Broadway.....	North line of
Brewster.....	North line of
Brewster.....	North line of
Burr.....	South line of
Burr.....	North and s
Burr.....	South line of
Burr.....	North and s
Burgess.....	West line of
Burgess.....	East line of
Bayless ave.....	South line of
Bayless ave.....	Head of Bay

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET.	LOCATION.	3 Inch.	4 Inch.	6 Inch.	12 Inch.	16 Inch.	20 Inch.	24 Inch.	30 Inch.	36 Inch.
Como.....	South line of Atwater, B. O.....									
Como.....	South line of Topping.....									
Como.....	East line of Da c.....									
Cherry.....	East line of Hoffman.....									
Cook.....	East and west line of Arcade.....									
Cook.....	West line of Greenbrier.....									
Cook.....	East line of Edgerton.....									
Cook.....	East and west line of McMenemy.....									
Cook.....	East line of Rice.....									
Case.....	East and west line of Arcade.....									
Case.....	West line of Greenbrier.....									
Case.....	East and west line of Edgerton.....									
Case.....	West line of DeSoto.....									
Case.....	West line of McMenemy.....									
Claghorn.....	South line of Blair.....									
Cromwell.....	North and south line of Pym.....									
Cudworth.....	West line of Langford.....									
Clark.....	North line of Whitall.....				1					
Clark.....	South line of Case.....				1					
Cross.....	West line of Argyle.....				1					
Cross.....	West line of Oxford.....				1					
Cross.....	East line of Lexington.....				1					
County Rd.....	South line of Dooley, on H.....				1					
Crocus Pl.....	South line of Goodrich.....									
Crocus Pl.....	South line of Fairmount.....									
Chataworth.....	North line of Evergreen.....									
Chataworth.....	North line of Union.....									
Cleveland.....	South line of University.....									
Cleveland.....	South line of Myrtle, on H.....									
Cleveland.....	South line of Wabash, on H.....									
Cleveland.....	200 ft. north of Mil. Ry., on H.....									
Cleveland.....	South line of Gilbert, on H.....									
Cleveland.....	North line of St Anthony.....									
Cleveland.....	Head of Rondo, on H.....									
Cleveland.....	South line of Marshall.....									
Cleveland.....	South line of Laurel.....									
Cleveland.....	North and south line of Summit.....									
Cortland.....	North and south line of Sycamore.....									
Cortland.....	North line of Agate, on H.....									
Cortland.....	North line of York, on H.....									
Cortland.....	North line of Poplar, on H.....									
Cortland.....	North line of Case, on M. and H.....									
Cortland.....	North line of Jenks, on H.....									
Cortland.....	North line of Lawson, on H.....									
Cortland.....	At Cook, on H.....				1					
Cortland.....	North line of Magnolia, on H.....				1					
Cortland.....	North line of Jessamine, on H.....				1					
Cortland.....	North line of Geranium, on H.....				1					
Cortland.....	North line of Rose, on H.....				1					
Cortland.....	South line of Maryland, on H.....				1					
Carter.....	East line of Gordon.....				1					
Cayuga.....	West line of Mississippi.....				1					
Cayuga.....	East line of Agate.....				1					
Cayuga.....	East line of Cortland.....									
Chelton.....	West line of Tatum.....									
Churchill.....	North line of Front.....									
Churchill.....	North line of Hatch.....									
Churchill.....	South line of Cross.....									
Churchill.....	South line of Van Slyke.....									
Cypress.....	North line of Euclid.....									
Cambridge.....	South line of Lincoln.....									
Dale.....	South line of Goodrich.....									
Dale.....	North and south line of Summit.....									
Dale.....	B. O., at Grand.....	1								
Dale.....	At Ashland B. O.....	1								
Dale.....	North and south line of Marshall.....									
Dale.....	North and south line of University.....				1					
Dale.....	North line of Lafond.....				1					
Dale.....	North line of Minnehaha M. & B.O.....				1					

LOCATION OF VALVES (HIGH SERVICE).

STREET.			
Pauquier	North		
Pauquier	East		
Fuller	West		
Fuller	East		
Fuller	West	4	
Fuller	East		
Fuller	East		
Fuller	East		
Fuller	West		
Fuller	East		
Fifth	East		
Floral	South	4	
Fourth	East		
Fourth	East		
Fourth	East		
Fourth	East		
Francis	West		
Front	East	4	
Front	East		
Front	East		
Front	East		
Front	East		
Front	East	4	
Front	East		
Front	East		
Front	East		
Forrest	North line of Conway		
Forrest	North line of Third		
Forrest	North line of Fremont		
Forrest	North line of Fourth		
Forrest	North line of Dawson		
Forrest	North line of York		
Forrest	South line of Cass		
Forrest	North line of Jessamine		
Fairmount	East of St. Albans 275 feet		
Fairmount	East line of Grotto	4	
Fairmount	East line of Victoria		
Fairmount	West line of Victoria		
Peronia	West line of Laura	4	
Peronia	East line of Prior	4	
Peronia	West line of Fairview		
Freemont	East and west line of Mendota		
Fairview	At Shields, on H		
Fairview	North and south line of Universal		
	M. H. and B. O.		
Fairview	At Sherburn on H		
Fairview	North line of Thomas		
Fairview	North and south line of Mint		
	haha		
Fry	North and south line of Minnehah		
Fry	South line of Van Buren		
Force Main	South of pumping station	4	
Force Main	B. O., at Trout Brook		
Force Main	South of McCarron Lake, M. & B		
Force Main	West line of Dale, M. and B. O.	1	4
Flandrau	North line of La Crosse		
Grand	East line of Oakland		
Grand	East and west line of Dale		
Grand	East line of Grotto		
Grand	East and west line of Victoria		
Grand	East line of Lexington		
Grand	East line of Cambridge		
Grand	West line of Cleveland	4	
Grove	B. O., at Trout Brook sewer	1	
Grove	East line of Monroe Place		1
Grove	B. O., at Pine	1	
Grotto	South line of Grand	1	
Grotto	North and south line of Summit	2	

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET.	LOCATION.	3 Inch.	4 Inch.	6 Inch.
Iglehart.....	West line of Louis.....			
Iglehart.....	West line of Farrington.....			
Iglehart.....	East and west line of Western ..			
Iglehart.....	East line of Mackubin.....			
Iglehart.....	East and west line of Dale.....			
Iglehart.....	East line of Grotto.....			
Iglehart.....	West line of Avon.....			
Iglehart.....	East and west line of Victoria ..			
Iglehart.....	East line of Chatsworth ..			4
Iglehart.....	East and west line of Fairview ..			
Iglehart.....	East and west line of Prior.....			
Jackson.....	North line of University ..			
Jackson.....	South line of Valley ..			
Jackson.....	North and south line of Como ..			
Jackson.....	South line of Pennsylvania.....			
Jackson.....	South line of Sycamore ..			
Jay.....	South line of Martin ..			1
Jay.....	South line of Fuller.....			1
Jessamine.....	East and west line of Arcade.....			
Jessamine.....	West line of Greenbrier ..			
Jessamine.....	East and west line of Edgerton.....			
Jessamine.....	East line of Bradley.....			
Jessamine.....	West line of Burr.....			
Jessamine.....	West line of Clark.....			
Jessamine.....	West line of Arkwright.....			
Jessamine.....	East and west line of McMenemy ..			
Jessamine.....	East line of Rice.....			
Jessie.....	North line of Case.....			
Jessie.....	North line of Jenks ..			
Jessie.....	North line of Lawson ..			
Jessie.....	North line of Cook ..			3
Jessie.....	North line of Magnolia.....			
Jessie.....	South line of Geranium.....			
Jessie.....	South line of Rose.....			
Jessie.....	South line of Maryland.....			
Jenks.....	East and west line of Arcade.....			
Jenks.....	West line of Greenbrier ..			
Jenks.....	East line of Edgerton.....			
Jenks.....	West line of DeSoto ..			
Jenks.....	East line of McMenemy.....			
Jenks.....	East line of Cortland ..			
Kent.....	South line of Holly ..			
Kent.....	South line of Ashland ..			
Kent.....	South line of Laurel ..			
Kent.....	South line of Selby ..			
Kent.....	North line of Marshall ..			
Kent.....	North line of Iglehart.....			
Knapp.....	East line of Langford ..			
Knapp.....	North line of Langford ..			
Keston.....	South line of Carter ..			
Laura.....	North and south line of Waltham ..			
Laura.....	South line of University ..			
Laurel.....	West line of Nina.....			
Laurel.....	East line of Virginia ..			
Laurel.....	East and west line of Western ..			
Laurel.....	East line of Mackubin ..			
Laurel.....	East and west line of Dale ..			
Laurel.....	East line of Grotto ..			
Laurel.....	West line of Avon.....			
Laurel.....	East and west line of Victoria ..			
Laurel.....	East line of Chatsworth ..			1
Lawton.....	South line of Summit ..			1
Lincoln.....	West line of Oakland ..			1
Lincoln.....	East and west line of Dale ..			2
Lincoln.....	East line of Grotto ..			1
Lincoln.....	East and west line of Victoria ..			2
Lincoln.....	East line of Chatsworth ..			1
Lincoln.....	West line of Cleveland ..			1
Lincoln.....	East line of Cambridge ..			1

STREET.	LOCATION.	3 Inch.	4 Inch.	6 Inch.	12 Inch.	16 Inch.	20 Inch.	24 Inch.	30 Inch.	36 Inch.
Maple..	North line of Fifth.....			✓						
Maple....	South line of Seventh.			✓						
Margaret..	East and west line of Earl .. .									
Margaret..	East line of Forrest .. .									
Margaret....	East and west line of Mendota...			✓						
Margaret....	North and south line of Seventh									
Margaret..	East line of Greenbrier .. .									
Martin	East and west line of Rice.....									
Martin	West line of Louis .. .									
Martin	West line of Farrington.....									
Martin	East and west line of Western ..									
Martin	East line of Mackubin.....									
Martin	East and west line of Dale.....			✓						
Martin..	West line of Victoria .. .									
Maria	South line of McLean .. .									
Maria	South line of Cherry.....									
Maria.....	North line of Plum.									
Maria..	North line of Hudson.									
Maria ..	South line of Ravine.....									
Maria	North line of Conway.									
Maria	South line of Fourth.....									
Maria.....	North line of Fifth .. .									
Maria..	North and south line of Seventh			✓						
Marshall ..	West line of Western.									
Marshall ..	East line of Mackubin.									
Marshall ..	East and west line of Dale.				✓					
Marshall ..	West line of Grotto.....									
Marshall ..	East and west line of Victoria..									
Marshall..	East line of Chataworth.									
Marshall....	East and west line of Fairview...									
Marshall ..	East and west line of Prior.									
Marshall..	East and west line of Cleveland..									
Mendota..	North line of Hudson.									
Mendota...	B. O at Euclid.	✓								
Mendota ..	South line of Fourth .. .									
Mendota ..	North line of Margaret M. & B. C									
Mendota..	North and south line of Seventh									
	M & B. O									
Mendota....	South line of Pauquier .. .			✓						
Mt. Airy ..	East line of Linden.....									
Mt. Airy, ...	West line of Warren... ..									
Mt Ida ..	West line of DeSoto.....									
Maryland...	West line of Greenbrier .. .									
Maryland ..	East and west line of Edgerton ..									
Maryland..	East line of Dale street main ..				✓					
Marion	North line of University.....									
Marion	North line of Sherburne			✓						
Marion	North line of Charles									
Marion	North line of Edmund									
Marion	North line of Thomas									
Minnehaha..	East and west line of Earl.....									
Minnehaha ..	North and south line of Seventh									
Minnehaha..	West line of Arcade.									
Minnehaha ..	East line of Greenbrier .. .			✓						
Minnehaha ..	West line of DeSoto .. .			1						
Minnehaha ..	West line of Dale .. .			1						
Minnehaha ..	East line of Pascal.....									
Minnehaha ..	East and west line of Snelling. .									
Minnehaha ..	East line of Aldine									
Minnehaha..	East and west line of Fairview ..			✓						
Mound	North and south line of Burns....			✓						
Manvel	East and west line of Bayless. .									
Magnolia ..	East line of Forrest									
Magnolia ..	East and west line of Arcade ..			✓						
Magnolia ..	West line of Greenbrier .. .									
Magnolia ..	East line of Edgerton.....									

LOCATION OF VALVES (HIGH SERVICE).—Continued.

Sydney	South line of Summit	1	
Syndicate	South line of Grand	1	
Stillwater	West line of White Bear	1	
Sinnet	South line of Seventh	1	
Third	East and west line of Mendota	2	
Third	East line of Maple	1	
Third	East and west line of Bates	2	
Third	South line of Summit	1	
Third Street,			
north	North line of east Third	1	
Tilton	East line of St. Peter	1	
Tilton	East line of Rice	1	
Thomas	West line of Como	1	
Thomas	West line of Gaultier	1	
Thomas	East line of Farrington	1	

INVENTORY OF STOCK AND TOOLS, DECEMBER 1, 1895.

12 feet 36 inch pipe.
 212 feet 30 inch pipe.
 192 feet 24 inch pipe.
 148 feet 20 inch pipe.
 192 feet 16 inch pipe.
 353 feet 12 inch pipe.
 855 feet 8 inch pipe.
 816 feet 6 inch pipe.
 636 feet 4 inch pipe.
 7 feet 3 inch pipe.
 5 pieces 30 inch curvature pipe.
 4 pieces 24 inch curvature pipe.
 1 piece 20 inch curvature pipe.
 3 pieces 16 inch curvature pipe.
 5 pieces 12 inch curvature pipe.
 2 pieces 8 inch curvature pipe.
 22 pieces 6 inch curvature pipe.
 17 pieces 4 inch curvature pipe.
 7 pieces 6 inch quarter bends.
 2 pieces 4 inch quarter bends.
 1 36-inch sleeve.
 2 30-inch sleeves.
 3 24-inch sleeves.
 4 20-inch sleeves.
 4 16-inch sleeves.
 6 12-inch sleeves.
 5 8-inch sleeves.
 15 6-inch sleeves.
 16 4-inch sleeves.
 1 30-inch open sleeve.
 1 24-inch open sleeve.
 1 20-inch open sleeve.
 2 16-inch open sleeves.
 1 12-inch open sleeve.
 2 8-inch open sleeves.
 5 6-inch open sleeves.
 7 4-inch open sleeves.
 1 16x6 in. sleeve and gate, Smith patent
 1 12x6 in. sleeve and gate, Smith patent
 1 8x6 in. sleeve and gate, Smith patent
 1 8x4 in. sleeve and gate, Smith patent
 3 6x6 in. sleeves and gate, Smith patent
 5 6x4 in. sleeves and gate, Smith patent
 2 6x2 in. sleeves and gate, Smith patent
 1 4x2 in. sleeve and gate, Smith patent
 1 24-inch plug.
 5 20-inch plugs.
 1 16-inch plug.
 9 12-inch plugs.
 10 8-inch plugs.
 20 6-inch plugs.
 31 4-inch plugs.
 1 30x6 inch 4-way branch.
 1 24x12 inch 4-way branch.
 1 24x6 inch 4-way branch.
 1 24x4 inch 3-way branch.
 1 16x16 inch 4-way branch.
 1 16x12 inch 4-way branch.
 1 16x12 inch 3-way branch.
 1 16x8 inch 3-way branch.
 1 16x6 inch 4-way branch.
 1 16x6 inch 3-way branch.
 1 16x4 inch 3-way branch.
 1 16x3 inch 3-way branch.
 1 12x12 inch 4-way branch.
 2 12x12 inch 3-way branches.
 1 12x8 inch 4-way branch.
 3 12x6 inch 4-way branches.
 3 12x6 inch 3-way branches.

1 12x4 inch 4-way branch.
 1 12x4 inch 3-way branch.
 2 8x6 inch 4-way branches.
 4 8x6 inch 3-way branches.
 3 8x4 inch 3-way branches.
 4 6x6 inch 4-way branches.
 4 6x6 inch 3-way branches.
 22 6x4 inch 4-way branches.
 4 6x4 inch 3-way branches.
 6 6x3 inch 3 way branches.
 6 4x4 inch 4-way branches.
 15 4x4 inch 3-way branches.
 2 4x3 inch 3-way branches.
 1 24x20 inch Y.
 1 20x20 inch Y.
 1 20x16 inch Y.
 1 12x12 inch Y.
 1 20 to 12 inch reducer.
 4 16 to 12 inch reducers.
 9 12 to 6 inch reducers.
 2 8 to 6 inch reducers.
 8 6 to 4 inch reducers.
 7000 pounds pig lead.
 90 pounds of hemp packing.
 1½ cans of blasting powder.
 90 blasting caps.
 1 electric battery for blasting rocks.

GATES AND GATE DUPLICATES.

1 20-inch gate.
 2 12-inch gates.
 4 8-inch gates.
 3 6-inch gates.
 13 4-inch gates.
 8 3-inch gates.
 11 2-inch stop and waste valves.
 25 2-inch valves.
 16 1½-inch stop and waste valves.
 7 1¼-inch stop and waste valves.
 3 1¼-inch valves.
 9 gate wrenches.
 5 iron gate boxes, complete.
 Miscellaneous lot of gate duplicates.

HYDRANTS.

6 D Mathew hydrants.
 11 S Mathew hydrants.
 1 casing for D hydrant.
 2 casings for S hydrants.
 3 casings for sprinkling pipes.
 4 rods for sprinkling pipes.
 26 hydrant wrenches.
 2 boilers for thawing hydrants.
 1 kit of tools for repairing hydrants.
 Miscellaneous lot of hydrant duplicates.

PIPE-LAYING TOOLS.

4 tool boxes.
 5 lead ladles.
 6 lead pots.
 6 lead furnaces.
 1 lead pot and furnace on wheels.
 5 derricks.
 2 Bagnall & Land diaphragm pumps.
 1 Centrifugal No. 4 steam pump.
 1 force pump.

OFFICE OF CITY ENGINEER.

ST. PAUL, MINN., December 1, 1895.

To the Board of Water Commissioners :

GENTLEMEN:—I submit herewith my report of the work under charge of the Engineering Department for the Board of Water Commissioners during the fiscal year ending November 30, 1895.

CONTRACT WORK.

The following contracts for the St. Paul Water Works have been executed under the supervision of the Engineering Department:

Million & Young—

44,197 feet of waterpipe, laying new mains, and relaying old ones. Contract finished this year. Total.....\$9,796.13

The Moran Construction Company—

275.4 lineal feet of sandrock tunnel and seven manholes. Contract finished this year. Total..... \$975.40

Patrick Doherty—

9,231.5 feet of 30-inch pipe with connections, etc. Contract finished this year. Total.....\$4,258.25

Patrick Thornton—

Open ditch north of Pleasant Lake and structures in connection with it. Work commenced in 1894 and finished this year. Total contract price.....\$3,790.89

Fencing of water works right-of-way. Contract finished this year. Total.....\$1,726.13

Ransome Subway Company—

Concrete conduit from Otter Lake and structures in connection therewith. Total contract price.....\$8,910.00
Estimates allowed in 1895.....\$6,477.00

Charles Stone—

Pumpwell and connection of artesian wells at Vadnais Lake. Total contract price.....\$3,875.00
Estimates allowed.....\$2,295.00

E. P. Allis & Co.—

Five million gallon pump at Vadnais Lake. Contract price.....\$7,500.00
Estimates allowed\$3,750.00

A record has been kept of the elevation of the lakes during the different months of the year, diagrams of which are hereby submitted on separate sheets. No water has been wasted from the Vadnais Lake system and none from the Rice Lake system except what may have seeped through the dam constructed at this point to hold back the water. At the end of the season all the lakes except Vadnais are left lower than usual.

The following table gives the precipitation at St. Paul for the different months of the fiscal year ending November 30th, 1895, the total rain fall being 25.4, or about 1.9 inches below the normal. These figures are obtained through the courtesy of Mr. P. F. Lyons of the signal service office at St. Paul:

December, 1894.....1.53	April.....2.09	August.....2.59
January, 1895.....1.05	May.....2.89	September.....4.75
February, 1895.....0.42	June.....4.18	October.....0.09
March, 1895.....0.85	July.....4.12	November.....0.85

ARTESIAN WELL AT CENTERVILLE.

To still further investigate what might be obtained from artesian wells at Centerville as a source of water supply, in addition to the two wells already sunk, a 12-inch well was put down during the past season. The following is a record of the strata through which the well was sunk:

STRATA.	TOTAL DEPTH.	REMARKS.
4 feet black muck.....		
8 feet blue clay.....	12	
30 feet sandy clay.....	42	
10 feet hard pan.....	52	
20 feet sand and gravel.....	72	Water commenced to flow.
10 feet clay.....	82	
12 feet fine sand.....	94	
33 feet lime rock.....	127	
7 feet soft plain sand.....	134	Well reduced to ten inches in diameter.
127 feet hard lime rock.....	261	
87 feet sand rock.....	348	Water increased to present flow.
79 feet blue shale.....	427	

The flow from this well was measured and found to be at the rate of 492,000 gallons in twenty-four hours, the well discharging from the surface of the ground at elevation 189. The capacity of the well was further tested by pumping with the following results: Drawing the well down to elevation 178.5 the discharge was 1,228,500 gallons. At elevation 183, the discharge was 947,700 gallons. The top of the casing is at elevation 183.4.

These results are quite satisfactory, and it would appear that there should be no difficulty in obtaining a supply of 10,000,000 gallons per day from a system of wells located at this point, somewhat similar to the construction of the system now in use at Vadnais Lake.

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CHIEF ENGINEER'S REPORT.

St. PAUL, December, 1895.

To the President and Members of the Board of Water Commissioners.

I respectfully submit to your honorable board my Eleventh Annual Report of the operation of the pumping stations for the year ending November 30, 1895.

McCarron Lake Station engines and boiler have not required any repairs during the year 1895 except in changing the valve on 3½-million pump, and take out the old large valves, 16 in number, and replace 300 2¾ inch rubber valves, the same increasing 20 per cent more water and higher duty, and changing Jet Condenser to Surface Condenser, thereby saving 115,000 gallons per day.

Boiler and pumps at Baldwin Lake have given good satisfaction during the year and have not required any repairs.

West Side station has been in continual operation during the year without any repairs on boiler or pumping machinery.

Vadnais Lake station has been running from July 8th to November 27, 1895.

The following tabulated record shows the operation at the different pumping stations:

M'CARRON LAKE STATION.

Total gallons pumped.....	1,536,912,600
Daily average gallons pumped.....	4,210,719
Total pounds coal used.....	2,536,020
Daily average coal used.....	6,948
Daily increase since 1894.....gallons	328,609

BALDWIN LAKE STATION.

Total number of gallons pumped.....	1,914,949,800
Daily average of gallons pumped.....	8,824,653
Total cords wood used.....	821
Daily average cords wood used	4

WEST SIDE STATION.

Total number of gallons pumped.....	10,529,640
Daily average of gallons pumped.....	28,848
Total pounds coal used.....	174,600
Daily average pounds coal used.....	479
Daily increase since 1894.....gallons	3,858

Respectfully submitted,

MARTIN FEIST,
Chief Engineer.

ST. PAUL WATER WORKS' PUMPING STATION AT MCCARRON LAKE.

ENGINEER'S REPORT FOR THE YEAR ENDING NOVEMBER 30, 1895.

Months.	NUMBER OF HOURS PUMPED.			NUMBER OF REVOLUTIONS.			NUMBER OF GALLONS PUMPED.			Total Per Month Pumped. Engines Nos. 1, 2 and 3.	Average per day pumped.	Total coal used per month.	Average lbs. of coal used per day.	Water pumped per day.
	Eng. No. 1.	Eng. No. 2.	Eng. No. 3.	Eng. No. 1.	Eng. No. 2.	Eng. No. 3.	Eng. No. 1.	Eng. No. 2.	Eng. No. 3.					
Dec., 1894	851½	645½	184,000	640,000										
Jan., 1895	25	173	548	63,600	383,600									
Feb., 1895			655											
Mar., 1895			702											
Apr., 1895			712½											
May, 1895			205											
June, 1895			702											
July, 1895	42	60	678	80,900	120,800	1,016,400	2,588,800							
Aug., 1895	67	129	595	160,900	240,500	984,000	5,148,800							
Sept., 1895			700											
Oct., 1895		3	731		6,500									
Nov., 1895			720											
Total	134	655½	7,923½	305,400	1,848,600	9,809,200	9,772,800							

Total gallons pumped 1,536,912,600
Daily average pumped 4,210,719
Total pounds coal used 2,536,020
Daily average coal used 6,948
Daily increase since 1894 328,600 gallons.

ST. PAUL WATER WORKS' PUMPING STATION, WEST SIDE.

ENGINEER'S REPORT FOR THE YEAR ENDING NOVEMBER, 30, 1895.

Months.	Number of hours pumped.	Total num- ber of revolutions.	Total number of gallons pumped.	Average per day pumped.	Total pounds of coal used.	Average coal used per day.
Dec., 1894	7.26	18,670	336,060	10,840	13,350	431
Jan., 1895	9.30	23,570	424,260	13,685	15,550	502
Feb., 1895	14.40	36,830	662,940	23,676	15,300	546
Mar., 1895	9.28	23,170	417,060	13,453	13,200	419
Apr., 1895	10.55	26,950	485,100	16,170	11,300	377
May, 1895	16.04	39,770	715,860	23,092	12,670	409
June, 1895	21.47	53,940	970,920	32,364	13,210	440
July, 1895	29.38	73,650	1,325,700	42,764	15,220	491
Aug., 1895	31.49	78,980	1,421,640	45,859	15,850	511
Sept., 1895	32.14	80,120	1,442,160	48,072	15,950	531
Oct., 1895	31.13	76,870	1,383,660	44,634	17,500	564
Nov., 1895	21.16	52,460	944,280	31,476	15,500	517
Total..	236.	584,980	10,520,640	28,848	174,600	479

Total number of gallons pumped.....	10,529,640
Daily average gallons pumped.....	28,848
Total pounds of coal used	174,600
Daily average coal used.....	479
Daily increase since 1894.....	3,858

**INVENTORY OF TOOLS AND STOCK AT McCARRON LAKE STATION.
NOVEMBER 30, 1895.**

1	Vise.	1	writing desk.
1	set of screw dies and taps from 1/4 inch to 1 inch.	6	electric lamps.
1	set of pipe dies and taps from 1/4 inch to 2 inches.	1	24-inch square.
2	pipe cutters.	2	chairs.
1	pair 2-inch pipe tongs.	2	ladders.
1	24-inch pipe wrench.	2	step ladders.
1	12-inch pipe wrench.	1	good cupboard.
1	24-inch Coe's wrench.	1	oil and waste cupboard.
1	14-inch Coe's wrench.	1	work bench.
1	8-inch Coe's wrench.	6	cuspidors.
1	portable blacksmith forge.	1	ratchet.
1	anvil.	1	ratchet brace and bit.
1	sledge hammer.	4	tack screws.
2	hand hammers.	75	feet 3/4 inch rope and block.
1	soft hammer.	1	draw knife.
6	files.	1	planer.
2	saws.	6	chisels.
1	ax.	1	Edison recording gauge.
1	hatchet.	1	Thompson's indicator.
1	1 1/2-ton chain block.	1	lot of old pipe and fittings.
1	3-ton chain block.	1	gate wrench.
50	ft. 1 1/4-inch rubber hose.	3	steel brooms.
3	oil tanks.	1	pair rubber boots.
3	2-quart oil cans.	150	pounds waste.
2	3-quart oil cans.	5	pounds tallow.
4	hand oilers.	30	pounds hemp packing.
1	quart measure.	43	gallons engine oil.
1	12-inch level.	6	gallons cylinder oil.
1	steel coal wheel barrow.	45	gallons kerosene oil.
3	coal scoops.	3	pounds polishing paste.
2	coal hammers.	93	tons Yough. coal.
1	Fairbank 6-ton.	40	pounds blacksmith coal.
1	Fairbank 1000-pound scale.	50	bars soap.
1	grind stone.	1	stove and pipe at the terminal chamber
3	large lanterns.	3	brooms.
4	small lanterns.	4	shovels.
1	clock.	2	water pails.
		1	Concord buggy.

**INVENTORY OF STOCK AND TOOLS AT THE WEST SIDE STATION.
NOVEMBER 30, 1895.**

1	24-inch pipe wrench.	1	step ladder.
1	14 inch Coe's wrench.	1	set engineer 5-piece brass hand oilers.
1	hand saw.	2	1/2-gallon measures.
1	ax.	2	hand oilers.
1	hatchet.	1	set of wrenches for pumps.
3	oil tanks.	1	set fire tools.
1	1000-pound Fairbanks scale.	50	feet of 1-inch rubber hose.
1	vise.	25	feet 3/4-inch steam hose.
1	work bench.	29	tons Yough coal.
2	coal shovels.	1/2	cord slabs.
1	wardrobe.	44	gallons engine oil.
1	clock.	32	gallons cylinder oil.
3	large lanterns.	14	gallons kerosene oil.
1	writing desk.	3	pound waste.
2	chairs.	1	lawn mower.
1	gate wrench.	1	hay rack.
1	steel coal wheel barrow.	1	flue cleaner.
1	cuspidor.		

**INVENTORY OF STOCK AND TOOLS AT BALDWIN LAKE STATION
NOVEMBER 30, 1895.**

1 vise.	1 3½-inch steam flue cleaner.
1 pair pipe tongs.	1 4-inch steam flue cleaner.
1 24-inch wrench.	50 feet 1½ inch rubber hose.
1 12-inch wrench.	1 pair rubber boots.
1 24-inch Coe's wrench.	1 ¾-inch auger.
1 14-inch Coe's wrench.	1 2-inch auger.
1 6-inch Coe's wrench.	2 crowbars.
1 hand hammer.	17 gallons kerosene oil.
1 coal hammer.	20 gallons engine oil.
1 saw.	20 gallons cylinder oil.
1 hatchet.	150 cords of wood.
1 ax.	7 pounds waste.
3 oil tanks.	5 pounds hemp packing.
2 1-quart cans.	5 pounds piston rod packing.
1 quart measure.	12 brass springs.
1 steel coal wheelbarrow.	2 gate wrenches.
2 coal scoops.	200 R. R. rails.
1 grindstone.	1 wheel push car.
3 large lanterns.	1 No. 10 centrifugal pump.
2 bracket lamps.	• 2 pieces 10-inch pipe 6 feet long.
3 hand lanterns.	2 pieces 10-inch pipe 5 feet long.
1 clock.	2 10 inch ells.
1 draw knife.	1 forge pump.
1 ice chisel.	2 steel brooms.
1 pair ice tongs.	12 12-inch square timbers.
1 ice scoop.	6 chisels.
1 ratchet brace and bit.	4 files.
1 chain.	2 calking tools.
1 2-ton chain block.	

**INVENTORY OF STOCK AND TOOLS AT VADNAIS LAKE.
NOVEMBER 30, 1895.**

GATE HOUSE.

4 storm windows.
4 window screens.
2 brooms.
1 steel broom.
1 shovel.
1 galvanized pail.
1 ice chisel.
1 ice saw.
8 steel traps.
1 gate wrench.
1 gate lock and key.
1 boat chain.
1 row boat.
1 pair oars.
1 pair rubber boots.

DWELLING HOUSE.

15 storm windows.
13 window screens.
2 screen doors.
12 window shades.
1 thermometer.
1 hand pump.
1 kalsomine brush.
2 storm doors.
2 ventilators for chimneys.

PUMPING STATION.

2 monkey wrenches.
2 S wrenches.
1 combination wrench.
2 cold chisels.
4 files.

2 hammers.
2 hand lanterns.
2 large globe lanterns.
1 spirit level.
3 paint brushes.
1 hand saw.
3 oil cans.
2 5-gallon oil cans.
3 50-gallon oil tanks.
1 steam flue cleaner.
1 3-inch steel flue cleaner.
10 gallons cylinder oil.
10 gallons engine oil.
4 tons coal.
2 8-inch iron flanges.
3 8-inch iron elbows.
50 feet 4-inch wrought iron pipe.
145 feet 8-inch wrought iron pipe.
18 feet 6-inch wrought iron pipe.
1 pick.
1 shovel.
50 feet rubber hose.
1 6-inch spreader.
2 scoop shovels.
1 coal hammer.
2 head-light lamps.
1 vise.
1 steel coal wheelbarrow.
1 1384 scale.
1 glass oil can.
1 grindstone.
1 ax.
1 grub hoe.
1 brush hook.
1 block plane iron.
1 draw knife.
1 tray of brass oilers, 5 pieces

INVENTORY OF STOCK AND TOOLS AT RESERVOIR.

4 chairs.	2 gate wrenches.
1 rocker.	1 air vent wrench.
1 rug, 7x9 feet.	1 plow.
1 table.	2 sets of sprinkling hose.
3 window shades.	1 sickle.
4 cellar storm windows.	2 storm doors.
12 storm windows.	1 coal stove.
8 shovels.	1 sledge.
4 picks.	2 rakes.
1 lawn mower.	1 fork.
1 scythe.	60 feet of rope.
10 scythe stones.	1 spade.
10 window screens.	1 hoe.
1 pail.	1 stop wrench.
1 grindstone.	1 paint brush.

Balance on hand December 1st, 1894.....				\$52
Dec.	1,	1894,	John Caulfield, Secretary.....	\$ 1,000.00
"	8,	"	"	1,000.00
"	14,	"	"	1,000.00
"	18,	"	"	1,000.00
"	21,	"	"	2,000.00
"	22,	"	"	2,000.00
"	27,	"	"	1,000.00
Jan.	3,	1895,	"	2,000.00
"	7,	"	"	10,000.00
"	11,	"	"	10,000.00
"	15,	"	"	2,000.00
"	19,	"	"	2,000.00
"	24,	"	"	1,000.00
"	29,	"	"	1,000.00
Feb.	9,	"	"	2,000.00
"	12,	"	"	1,000.00
"	16,	"	"	1,000.00
"	19,	"	"	1,000.00
"	20,	"	"	2,000.00
"	25,	"	"	2,000.00
"	26,	"	"	1,000.00
"	27,	"	"	2,000.00
"	28,	"	"	3,000.00
Mar.	6,	"	"	10,000.00
"	8,	"	"	10,000.00
"	12,	"	"	5,000.00
"	14,	"	"	2,000.00
"	18,	"	"	2,000.00
"	21,	"	Water frontage.....	18,629.76
"	25,	"	John Caulfield, Secretary.....	2,000.00
"	30,	"	"	2,000.00
Apr.	6,	"	"	2,000.00
"	9,	"	"	1,000.00
"	15,	"	"	1,000.00

OF THE CITY OF ST. PAUL, FOR 1895.

145

Apr.	18,	1895,	Water frontage.....	\$625.00
"	19,	"	John Caulfield, Secretary.....	1,000.00
"	22,	"	" "	3,000.00
"	25,	"	" "	1,000.00
"	30,	"	" "	2,000.00
May	6,	"	" "	1,000.00
"	7,	"	" "	1,000.00
"	9,	"	" "	1,000.00
"	10,	"	" "	3,000.00
"	18,	"	" "	1,000.00
"	20,	"	" "	1,000.00
"	24,	"	" "	1,000.00
June	4,	"	" "	1,000.00
"	5,	"	" "	1,000.00
"	8,	"	" "	1,000.00
"	13,	"	" "	1,000.00
"	17,	"	" "	1,000.00
"	22,	"	" "	1,000.00
"	25,	"	" "	1,000.00
"	29,	"	" "	1,000.00
July	1,	"	" "	2,000.00
"	6,	"	" "	5,000.00
"	8,	"	Water frontage.....	15,000.00
"	10,	"	John Caulfield, Secretary.....	10,000.00
"	12,	"	" "	5,000.00
"	16,	"	" "	5,000.00
"	19,	"	" "	2,000.00
"	24,	"	Water frontage.....	100,000.00
"	25,	"	John Caulfield, Secretary.....	1,000.00
"	27,	"	" "	1,000.00
"	31,	"	" "	2,000.00
Aug.	3,	"	Tax receipts.....	5,476.29
"	8,	"	John Caulfield, Secretary.....	1,000.00
"	12,	"	" "	1,000.00
"	16,	"	" "	1,000.00
"	19,	"	" "	2,000.00
"	21,	"	" "	1,000.00
"	24,	"	" "	2,000.00
"	29,	"	" "	2,000.00
"	31,	"	" "	2,000.00
Sept.	7,	"	" "	10,000.00
"	10,	"	" "	10,000.00
"	12,	"	" "	2,500.00
"	14,	"	" "	6,000.00
"	17,	"	" "	2,500.00
"	21,	"	" "	2,000.00
"	26,	"	" "	1,000.00
"	30,	"	" "	2,000.00
Oct.	1,	"	" "	1,000.00
"	8,	"	" "	1,000.00
"	9,	"	" "	1,000.00
"	14,	"	" "	1,000.00
"	16,	"	" "	1,000.00
"	21,	"	" "	1,000.00
"	25,	"	" "	1,000.00
"	31,	"	" "	2,000.00
Nov.	8,	"	" "	1,000.00
"	11,	"	" "	1,000.00
"	14,	"	Water frontage.....	7,440.35
"	18,	"	John Caulfield, Secretary.....	1,000.00

Nov. 20, 1895, John Caulfield, Secretary	\$1,000.00
" 23, " " " "	1,000.00
" 25, " " " "	1,000.00
" 29, " " " "	2,352.66
	<u>\$358,524.06</u>
Total.....	\$411,336.23

DISBURSEMENTS.

Dec., 1894, to cash.....	\$21,223.47
Jan., 1895, "	13,152.70
Feb., " "	12,343.54
March, " "	30,836.92
April, " "	14,862.01
May, " "	35,900.54
June, " "	37,755.16
July, " "	48,710.95
Aug., " "	70,773.43
Sept. " "	35,523.75
Oct. " "	23,013.38
Nov. " "	18,569.16
	<u>\$362,665.01</u>
Balance on hand Dec. 1, 1895.....	\$48,671.22
	<u>\$411,336.23</u>
Total.....	\$411,336.23

WATER DEPARTMENT SINKING FUND.

RECEIPTS.

By balance Dec. 1, 1894.....	\$3,907.07
1895.	
Jan. 15, by certificates of indebtedness department..	\$1,695.00
Feb. 15, " " " " ..	765.00
March 14, " " " " ..	1,590.00
May 15, " " " " ..	3,405.00
June 14, " " " " ..	1,017.50
June 14, by redeemed tax levy certificate of indebtedness.....	55,000.00
July 8, by cash.....	25,000.00
July 18, by redeemed tax levy certificate of indebtedness.....	163,500.00
July 18, by certificates of indebtedness department....	2,835.00
Aug. 13, by certificate of indebtedness department....	50,000.00
Sept. 21, by redeemed tax levy certificates of indebtedness.....	30,600.00
Sept. 21, By certificates of indebtedness department..	962.50
	<u>\$335,770.00</u>
Total.....	\$339,677.07

DISBURSEMENTS.

1894.	
Dec. 14, To Broadway bridge.....	\$1,000.00
Dec. 14, To certificates of indebtedness department...	15.00
Dec. 14, To Sinking Fund.....	7.50
1895.	
Feb. 20, To Broadway bridge.....	5,000.00

Feb. 20, To certificates of indebtedness department..	\$25.00	
Feb. 20, To Sinking Fund....	41.70	
March 15, To Broadway bridge.....	1,500.00	
March 15, To certificates of indebtedness department	12.51	
March 15, To Sinking Fund.....	12.51	
May 15, To Broadway bridge.....	1,500.00	
May 15, To certificates of indebtedness department..	25.00	
May 15, To Sinking Fund.....	12.51	
May 16, To Tenth ward sewer.....	2,000.00	
May 16, To certificates of indebtedness department..	16.67	
May 16, To Sinking Fund.....	16.68	
June 18, To Warren Scharff Asphalt Company.....	40,000.00	
June 18, To Tenth ward sewer.....	16,000.00	
June 18, To certificate of indebtedness department....	23.35	
June 18, To Sinking Fund.....	280.00	
July 2, To Tenth ward sewer.....	4,000.00	
July 2, To Broadway bridge.....	21,000.00	
July 2, To certificate of indebtedness department.....	65.42	
July 2, To Sinking Fund.....	125.00	
July 8, To certificate of indebtedness department.....	24.23	
July 18, To tax levy certificate of indebtedness.....	103,000.00	
July 18, To Sinking Fund.....	1,030.00	
Oct. 16, To tax levy certificate of indebtedness.....	2,000.00	
Oct. 16, To certificate of indebtedness department....	25.00	
Oct. 16, To Sinking Fund.....	8.32	\$198,766.40
To balance on hand Dec. 1st, 1895.....		140,910.67
Total.....		\$339,677.07

FIFTEENTH ANNUAL REPORT

OF THE

BOARD

OF

WATER COMMISSIONERS

OF THE

CITY OF SAINT PAUL.

JANUARY 1, 1897.

ST. PAUL, MINN.:
THE PIONEER PRESS COMPANY.
1897.

OFFICERS
OF THE
CITY WATER WORKS.
JANUARY 1, 1897.

BOARD OF WATER COMMISSIONERS.

R. B. C. BEMENT, President. Term expires Jan. 1, 1901.
JOHN H. WOLTERSTORFF. Term expires Jan. 1, 1901.
J. F. HOYT. Term expires Jan. 1, 1900.
H. E. STEVENS. Term expires Jan. 1, 1898.
THOS. GRACE. Term expires Jan. 1, 1899.

JOHN CAULFIELD, Secretary.
A. R. STARKEY, Superintendent.
L. W. RUNDLETT, City Engineer and Engineer of the Board.
MARTIN FEIST, Chief Engineer and Engineer of McCarron Lake Station.
M. THOMMES, Assistant Engineer of McCarron Lake Station.
H. GEISLER, Gate Keeper and Engineer of Vadnais Lake Station.
A. A. THOMPSON, Assistant Engineer of Vadnais Lake Station.
JACOB ABRESCH, Engineer of Centerville Station.
JOS. DOERR, Engineer of West St. Paul Station.
F. J. KENNY, Assistant Engineer of West St. Paul Station.
GEO. DOORLEY, Meter Inspector.

value of the water works determined by capitalizing them at a figure which, at say four per cent, the net earnings of the department would pay interest upon.

We only call attention to this point because we have been frequently asked to explain the discrepancy between our figures of cost and that shown in the comptroller's report.

(Signed)

R. B. C. BEMENT,
THOS. GRACE,
J. F. HOYT,
JOHN H. WOLTERSTORFF,
H. E. STEVENS.

TABLE NO. 1.

Trial Balance, Dec. 31, 1896.

Account.	Dr.	Cr.
St. Paul water works (original purchase).....	\$510,000.00	
Bond account		\$2,460,000.00
General water receipts.....		2,050,691.67
Miscellaneous water receipts.....		253,031.14
Connection (services)		6,160.29
Extension	1,901,626.79	
General maintenance	300,206.90	
Repair	53,752.16	
Meter	40,064.55	
Construction	1,237,267.94	
Interest	1,200,542.61	
General water receipts (hydrant account).....		121,603.19
Sinking fund	305,590.71	
Sinking fund earnings.....		46,927.52
Shutting off and turning on water.....		2,207.00
Frontage tax		934,389.02
Bank of Minnesota.....	313.44	
C. L. Horst, city treasurer.....	9,744.73	
	<hr/>	<hr/>
	\$5,875,069.83	\$5,875,069.83

TABLE NO. 3.

RECEIPTS AND DISBURSEMENTS FROM AUG. 10, 1882, TO DECEMBER 31, 1882.

General water receipts, high service...	\$550,527.23	
General water receipts, low service.....	876,736.15	
General water receipts, meters.....	623,428.20	
	<hr/>	\$2,050,691.67
Miscellaneous receipts, builders	\$37,467.80	
Miscellaneous receipts, water carts....	3,706.13	
Miscellaneous receipts, flushing sewers	11,571.62	
Miscellaneous receipts, filling cisterns.	20,322.09	
Miscellaneous receipts, sprinkling sts..	179,873.50	
	<hr/>	\$253,031.14
Connections (services)		292,380.47
Extension		31,335.73
Interest		67,064.84
Sinking fund		7,050.42
Frontage tax		936,940.79
Meter		58.60
Shutting off and turning on water....		2,207.00
Repairs		3,259.15
Construction		3,094.26
Bills payable		653,000.00
Bonds		2,110,000.00
General water receipts (hydrant acc't)		121,063.19
Sinking fund earnings.....		52,126.16
Total receipts		<hr/> \$6,100,000.00
DISBURSEMENTS.		
General Maintenance—		
Salaries	\$214,855.07	
Stationery and printing.....	14,624.24	
Miscellaneous	8,382.15	
Labor	56,684.77	
Material and fuel.....	92,886.59	
Stable—feed	5,434.39	
Stable—repairs	3,309.69	
Connections—	<hr/>	\$396,266.90
Labor	\$162,928.10	
Pipe	76,030.48	
Brass goods and stop boxes.....	39,016.25	
Tools and miscellaneous	8,245.35	
Repairs—	<hr/>	\$286,220.18
Hydrants—labor	\$36,046.07	
Hydrants—material	1,729.75	
Valves—labor	1,249.39	
Valves—material	547.02	
Mains—labor	15,190.93	
Mains—material	2,249.05	
Meters—	<hr/>	\$57,011.31
Labor and supplies	\$16,304.25	
Freight and meters	33,718.90	
Extensions—	<hr/>	\$50,023.15
Pipe and special castings.....	\$1,060,709.01	
Labor	622,024.84	
Tools and repairs of same.....	19,846.28	
Advertising	334.04	
Fire hydrants	97,499.23	
Valves and valve boxes.....	77,729.53	
Lead and hemp packing.....	67,054.79	
Lumber and material.....	22,760.58	
Miscellaneous and building account...	25,004.22	
Construction (New Supply)—	<hr/>	\$1,992,962.52
Pipe and special castings.....	\$187,066.71	
Labor and contracts.....	656,306.91	
Tools and repairs of same.....	5,374.74	
Lumber and material.....	90,477.60	
Freight	9,479.22	
Engineering and right of way.....	125,811.55	
Miscellaneous and building account...	18,960.70	
Reservoirs	147,484.77	
	<hr/>	\$1,240,062.20
Interest		1,358,507.45
Refunded frontage tax.....		2,551.77
Bills payable		653,000.00
Bond		160,000.00
Sinking fund		372,165.24
Sinking fund earnings		6,574.53
Total disbursements		<hr/> \$6,100,000.00
Balance		

ACCOUNT WITH CITY TREASURER—Concluded.

1895.			
June 25....	Cash.....	1,000.00	
June 29....	Cash.....	1,000.00	
June 30....	Cash.....	1,500.00	
			11,000.00
July 8....	Cash.....	\$10,000.00	
July 10....	Cash.....	5,000.00	
July 13....	Cash.....	5,000.00	
July 15....	Cash.....	5,000.00	
July 18....	Cash.....	2,000.00	
July 20....	Cash.....	2,000.00	
July 22....	Cash.....	1,000.00	
July 24....	Cash.....	1,000.00	
July 29....	Cash.....	1,000.00	
July 30....	Cash.....	25.48	
July 30....	Cash.....	500.00	
			32,525.48
Aug. 1....	Cash from county treasurer on account of frontage tax	\$103,947.13	
Aug. 6....	Cash.....	1,000.00	
Aug. 7....	Cash.....	1,000.00	
Aug. 8....	Cash.....	1,000.00	
Aug. 10....	Cash.....	1,000.00	
Aug. 12....	Cash.....	1,000.00	
Aug. 15....	Cash.....	1,000.00	
Aug. 18....	Cash.....	1,000.00	
Aug. 21....	Cash.....	1,000.00	
Aug. 22....	Cash.....	3,000.00	
Aug. 26....	Cash.....	1,000.00	
Aug. 27....	Cash.....	1,000.00	
Aug. 28....	Cash.....	1,000.00	
Aug. 29....	Cash.....	1,000.00	
Aug. 31....	Cash.....	2,500.00	
			121,447.13
Sept. 5....	Cash.....	\$20,000.00	
Sept. 10....	Cash.....	2,000.00	
Sept. 12....	Cash.....	2,000.00	
Sept. 14....	Cash.....	2,000.00	
Sept. 16....	Cash.....	2,000.00	
Sept. 17....	Cash.....	1,000.00	
Sept. 19....	Cash.....	1,000.00	
Sept. 22....	Cash.....	1,000.00	
Sept. 24....	Cash.....	1,000.00	
Sept. 25....	Cash.....	2,000.00	
Sept. 29....	Cash.....	1,000.00	
Sept. 30....	Cash.....	500.00	
			35,500.00
Oct. 6....	Cash.....	\$1,600.00	
Oct. 9....	Cash.....	1,000.00	
Oct. 13....	Cash.....	1,000.00	
Oct. 16....	Cash.....	1,000.00	
Oct. 17....	Cash.....	1,000.00	
Oct. 19....	Cash.....	1,000.00	
Oct. 24....	Cash.....	1,000.00	
Oct. 28....	Cash.....	1,000.00	
Oct. 29....	Cash.....	600.00	
Oct. 31....	Cash.....	1,000.00	
			9,600.00
Nov. 6....	Cash.....	\$1,000.00	
Nov. 7....	Cash.....	1,000.00	
Nov. 10....	Cash.....	1,000.00	
Nov. 18....	Cash.....	1,000.00	
Nov. 20....	Cash.....	1,000.00	
Nov. 21....	From county treasurer, ac- count frontage tax.....	4,790.07	
Nov. 27....	Cash.....	1,000.00	
			10,790.07
Dec. 7....	Cash.....	\$1,000.00	
Dec. 8....	Cash.....	1,000.00	
Dec. 11....	Cash.....	1,000.00	
Dec. 14....	Cash.....	1,000.00	
Dec. 15....	Cash.....	1,000.00	
Dec. 16....	Cash.....	1,000.00	
Dec. 24....	Cash.....	1,000.00	
Dec. 28....	Cash.....	745.45	
			7,745.45
Total			343,543.41
			\$385,213.52

TABLE NO. 7.

BOND ACCOUNT JANUARY 1, 1897

Date of Legislative Acts Authorizing Issue of Bonds.	Amount of Bonds Au- thorized.	Date of Bonds Issued.	When Due.	Amount of Bonds Issued.	Rate.	INTEREST PAYABLE.										Total Annual Interest.			
						Dec. 1.	Jan. 2.	Feb. 1.	Mar. 2	April 1.	May 2.	June 1.	July 2.	Aug. 1.	Sept 1.		Oct. 1.	Nov. 2.	
Feb. 10, 1881	\$600,000	June 1, 1882	30 years	\$350,000	4 per cent	\$7,000													\$14,000
Jan. 26, 1883	500,000	Aug. 1, 1883	30 years	150,000	5 per cent			\$3,750						\$3,750					7,500
Feb. 21, 1885	800,000	April 1, 1884	25 & 30 years	600,000	5 per cent					\$15,000						\$15,000			30,000
Jan. 31, 1887	200,000	April 1, 1885	30 years	400,000	5 per cent					10,000						10,000			20,000
Jan. 31, 1887	100,000	May 2, 1887	30 years	200,000	4½ per cent						\$4,500							\$4,500	9,000
Mar. 29, 1889	300,000	Mar. 1, 1888	30 years	300,000	4½ per cent				\$6,750							\$6,750			13,500
		Jan. 1, 1889	30 years	100,000	4½ per cent		\$2,250						\$2,250						4,500
		Jan. 2, 1889	30 years	100,000	4½ per cent		3,000						3,000						7,200
		May 1, 1889	30 years	100,000	4½ per cent						2,250							2,250	4,500
		May 1, 1890	30 years	100,000	4 per cent						2,000							2,000	4,000
	2,580,000			\$2,400,000		\$7,000	\$5,850	\$3,750	\$6,750	\$25,000	\$8,750	\$7,000	\$5,850	\$3,750	\$6,750	\$25,000	\$8,750	\$114,200	

TABLE NO. 11.
FRONTAGE TAX ACCOUNT COLLECTIONS—BALANCE DUE JAN. 1, 1897.

RECEIPTS FOR YEARS.	1869 and Previous.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	Total.
March 17, 1896.....	\$9.56	\$28.86	\$100.53	\$421.72	\$515.12	\$10,981.65	\$2,368.83	.....	\$14,435.28
August 1, 1896.....	14.20	3.61	76.93	310.60	219.29	14,927.42	88,395.08	.....	103,847.13
November 1, 1896.....	.....	.....	43.66	187.32	147.51	1,173.94	3,237.84	.....	4,790.07
Total receipts.....	23.70	32.47	230.12	919.64	881.79	27,083.01	94,001.75	.....	123,172.48
Amount due Dec. 1, 1895, as per last report	1,469.98	2,228.48	1,953.80	2,202.99	1,697.98	35,384.73	125,374.28	.....	170,312.22
Amount of 1896 assessment collectible in 1897 .....	.....	.....	.....	.....	.....	.....	.....	114,925.17	47,139.74 114,925.17
Amount due Jan. 1, 1897.....	\$1,446.28	\$2,196.01	\$1,723.68	\$1,283.35	\$816.19	\$8,301.72	\$31,372.51	\$114,925.17	\$162,164.91

THE FOLLOWING TABLE SHOWS THE NUMBER OF APPLICATIONS
MADE FOR WATER SERVICES ANNUALLY FROM 1899 TO DATE.

PUMPING PLANTS.

EXPENSE MAINTAINING THE FOUR (4) PUMPING STATIONS AND RESERVOIR.

STATION.	Salaries.	Fuel.	Waste and Machine Oil.	Repairs.	Kero-sene Oil.	Total.
McCarron Lake station.....	\$3,747.00	\$5,983.64	\$202.40	\$303.74	.....	\$10,236.78
Baldwin Lake station..	1,564.70	1,897.88	17.82	14.40	\$15.93	3,810.73
Vadnais Lake station	1,147.48	1,818.77	44.22	38.76	32.52	2,881.75
West St. Paul station.....	1,430.00	520.98	4.58	33.37	12.00	2,000.93
Reservoir	430.00	.....	.....	.....	.....	430.00
	\$8,319.18	\$9,510.17	\$359.08	\$392.27	\$60.45	\$18,941.15

TABLE NO. 19.
EXPENSE FOR MAINTAINING PUMPING STATIONS AND RESERVOIR FOR YEARS 1891-2-3-4-5 and 6.
McCARRON LAKE STATION.

Year.	Salaries.	Fuel.	Machine Oil and Waste.	Repairs and Supplies.	Kerosene Oil.	To'al.	WATER PUMPED.		FUEL, COAL, ETC.		Daily Increase in Pumping, Gallons.
							Annually.	Daily.	Annually.	Daily	
1891.....	\$3,540.00	\$4,702.12	\$213.86	\$230.66	\$38.50	\$8,725.14	1,108,034,800	3,030,232	2,134,000	5845	871,000
1892.....	3,575.00	5,400.89	302.36	37.82	38.75	9,352.82	1,071,130,320	2,984,603	2,036,734	5590	.....
1893.....	3,593.00	5,413.30	279.56	329.46	Electric.	9,615.32	1,298,551,200	3,557,674	2,147,888	5844	623,070
1894.....	3,706.50	5,012.85	237.99	351.12	5.20	9,313.66	1,300,813,800	3,882,110	2,345,731	6427	323,000
1895.....	3,652.00	5,034.79	243.57	269.09	5.20	9,204.65	1,538,912,600	4,210,719	2,536,020	6948	338,600
1896 (13 mos.).	3,747.00	5,963.64	252.40	305.74	.....	10,308.78	1,651,534,200	4,160,011	2,751,698	6915	*50,708

*Decrease.

BALDWIN LAKE STATION.

1891.....	\$1,507.16	\$4,908.44	\$51.98	\$77.39	\$22.14	\$6,657.11	1,983,034,500	8,077,535	{ Coal 150,275 } Wood 797 1/4 }	.....	.....
1892.....	1,062.08	941.00	56.28	56.12	11.90	2,127.39	1,153,794,000	9,470,288		.....	.....
1893.....	1,145.66	778.42	45.18	363.99	10.35	2,343.60	1,104,158,600	9,219,623		.....	.....
1894.....	1,245.66	1,182.05	49.80	251.63	10.30	2,739.44	1,449,380,800	9,662,406		4 1/2	.....
1895.....	1,450.00	2,524.46	23.77	45.19	27.08	4,070.50	1,914,949,800	8,824,653		4	.....
1896 (13 mos.).	1,564.70	1,097.88	17.88	14.40	15.03	3,810.79	1,917,058,000	9,271,715		4 3/4	.....

TABLE NO. 20.

COMPARATIVE STATEMENT OF HOSE VIOLATIONS FOR 1894-5 AND 1895.

VIOLATION.	1894.			1895.		
	High.	Low.	Total.	High.	Low.	Total.

LIST OF VOUCHERS—Continued.

JULY, 1895—Continued.

No. of Voucher.	NAME.	CLAIM.	AMOUNT.
8108	Odgen, Merrill & Greer.....	Glasses	\$0.29
8109	Cornplanter Oil Co.....	Gasoline	1.95
8110	H. Wedelstaedt & Co.....	Drawing cloth and paper.....	6.88
8111	A. Decker & Co.....	Nails .....	.50
8112	R. Price.....	Veterinary services.....	Void
8113	C. E. Green, register of deeds....	Recording deeds and abstracts	4.25
8114	R. H. Hunt & Co.....	Inspecting pipe.....	403.51
8115	Wedelstaedt & Carmen.....	Printing	20.10
8116	J. F. McCarthy.....	Est. No. 2, wells at Centerville	2,887.96
Total .....		.....	\$54,775.09

LIST OF VOUCHERS—Continued.

SEPTEMBER, 1896—Continued.

No. of Voucher.	NAME.	CLAIM.	Amount.
8238	Hennessey & Cox.....	Est. No. 2, engine house, Centerville	3,995.00
8239	J. F. McCarthy.....	Est. No. 4, wells at Center- ville	1,463.19
8240	N. Feyen.....	Est. No. 2, connecting wells at Centerville	807.50
8241	Adam Decker.....	Hardware	1.65
8242	Mahle & Sutmar.....	Repairing buggies, etc.....	6.90
8243	P. Doherty.....	Est. No. 3, pipelaying, city...	1,436.04
8244	St. Paul Foundry Co.....	Est. No. 2, specials for Cen- terville	1,451.03
8245	N. Feyen.....	Est. No. 3, drayage to Center- ville	79.44
Total .....		.....	\$50,410.57

LIST OF VOUCHERS—Continued.

OCTOBER, 1896—Continued.

No. of Voucher.	NAME.	CLAIM.	Amount.
8303	Hobart & Willis.....	One 4-inch Ell.....	1.90
8304	A. H. Fitch, clerk of district court	Fees right of way matter.....	25.00
8305	St. Paul Plow Co.....	Est. No. 4, specials.....	348.88
8306	Fielding & Shepley.....	Relaying pavement.....	9.89
8307	D. Cardinal.....	Hay	25.62
8308	Jno. Caulfield, secretary.....	Cash advanced per vouchers..	29.87
8309	Patrick Doherty.....	Est. No. 4, pipelaying.....	511.51
8310	Jos. M. Forcier.....	Teaming to Baldwin Lake....	12.00
8311	J. F. McCarthy.....	Est. No. 5, wells at Centerville	2,300.73
8312	Hennessey & Cox.....	Est. No. 3, engine house, Centerville	1,955.00
8313	Hennessey & Cox.....	Est. No. 3, wooden conduit, Centerville	3,859.34
8314	Nicholas Feyen.....	Est. No. 3, pipelaying, Centerville	765.00
8315	Fairbanks, Morse & Co.....	Est. No. 2, laying 36-in. main to reservoir.....	4,380.46
8316	C. L. Horst, city treasurer.....	For investment in sinking fund	15,000.00
8317	Great Northern Railroad Co.....	Repairing track over Rice street main.....	5.03
8318	Nicols & Dean.....	300 feet $\frac{3}{4}$ round iron, Centerville	8.70
8319	N. W. Stamp Works.....	Three inspectors' badges.....	2.25
8320	Wedelstaedt & Carmen.....	Printing	5.75
8321	J. M. Molliter.....	Drayage to Baldwin Lake....	1.00
8322	R. N. Cardozo.....	Stove, etc., engineers at Centerville	4.25
8323	Jno. Rogers, Jr., & Bro.....	Insuring boilers, pump house.	150.00
8324	Minnesota Engine Works.....	3 moulds for dash pots, Vadnais	2.33
8325	So. Park Foundry and Mach. Co..	36 5-inch hydrant stuff boxes.	25.20
8326	St. Paul Foundry Co.....	Channel iron for boilers, Centerville	52.64
8327	Jos. Garcean.....	Blacksmithing	2.35
8328	Thos. Brennan Lumber Co.....	Est. No. 2, lumber, Otter Lake	436.68
8329	The Western Supply Co.....	Est. No. 1, lead pipe.....	329.42
8330	N. W. Shot and Lead Works.....	Pig lead and lead pipe.....	304.57
8331	St. Paul Lime and Cement Co....	Sewer pipe, brick and cement.	107.71
8332	N. Feyen.....	Est. No. 4 and final, connecting wells, Centerville.....	851.76
8333	J. F. McCarthy.....	Est. No. 6, final, sinking wells, Centerville	54.59
8334	Thomson Meter Co.....	Meter repairs.....	6.05
8335	N. Hendy.....	Damages	50.00
8336	N. Feyen.....	Est. No. 1, final, moving boilers	74.00
Total			\$49,925.74

LIST OF VOUCHERS—Continued.

DECEMBER, 1896—Continued.

No. of Voucher.	NAME.	CLAIM.	Amount.
8470	A. and W. McGulggan.....	Carpenter work.....	8.15
8471	Pioneer Press Co.....	Printing	8.00
8472	Geo. J. Grant.....	Rent of portable engine.....	34.00
8473	So. Park Foundry and Mach. Co.	Cast sleeves	12.46
8474	Mahle & Sutmar.....	Blacksmithing	25.00
8475	Jno. Caulfield, Sec'y.....	Cash advanced by voucher...	42.64
8476	N. Feyen.....	Est. No. 2, grading at Center- ville	143.85
8477	Hennessy & Cox.....	Est. No. 6, conduit, Centerville	6,307.19
8478	Hennessy & Cox.....	Est. No. 5, engine at Center- ville	1,573.50
8479	St. Paul Foundry Co.....	Special castings	977.98
Total			\$18,947.07
Grand total.....			\$385,468.79

WATER MAINS ON HIGH SERVICE.—Continued.

STREET.	FROM STREET TO STREET.	4-Inch.	6-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
Van Slyke...	Chatsworth to Lexington		1438						
Wabasha....	Summit to Park av.	537	842						
Western....	Summit to Como....			1775	6285				
Williams....	Olive to Mississippi.		857						
Waltham....	Laura to Prior.....	650							
Wayzata....	At Albemarle.....		90						
Wilder.....	Iglehart to St. Ant..		1388						
Whitall.....	Payne to Clark.....		2301						
Walker.....	Hewitt to Great Northern Ry.....	807							
Wesley.....	Pascal to Fry.....	304	621						
Workhouse..	Around workhouse..		1043						
Wheeler St..	Bayless to Everett..			1012					
Westminster.	Cayuga to Case.....		990						
Wheeler Av..	Univers'y to Shields		588						
Woodbridge.	Atwater to Front...		1207						
Winnipeg....	Rice to Sylvan.....		1142						
Wells.....	Edgerton to Arcade		1804						
Wells, south side.....	From E. to W. end of retaining wall..	1130							
White Bear..	Seventh to Ames....			1902					
York.....	Forrest to Cortland.		5782						
	Total	37423	542470	120490	87188	36224	15495	9234	8013

		Feet.
Total	4-inch pipe.....	37,423
Total	6-inch pipe.....	542,470
Total	12-inch pipe.....	120,490
Total	16-inch pipe.....	87,188
Total	20-inch pipe.....	36,224
Total	24-inch pipe.....	15,495
Total	30-inch pipe.....	9,234
Total	36-inch pipe.....	8,913

Total 857,455 feet, or 162.3067 miles.

INVENTORY OF STOCK AND TOOLS, JAN. 1, 1897.—PIPE SPECIALS

ETC.

345 feet 36-inch pipe (castiron).	1 24x10x20 Y.
228 feet 30-inch pipe (castiron).	1 20x20x20 Y.
96 feet 24-inch pipe (castiron).	1 20x16x16 Y.
156 feet 20-inch pipe (castiron).	1 12x12x12 Y.
62 feet 16-inch pipe (castiron).	1 20 to 12-inch reducer.
76 feet 12-inch pipe (castiron).	4 16 to 12-inch reducers.
115 feet 8-inch pipe (castiron).	8 12 to 6-inch reducers.
1458 feet 6-inch pipe (castiron).	1 8 to 6-inch reducer.
1210 feet 4-inch pipe (castiron).	2 6 to 4-inch reducers.
6 feet 3-inch pipe (castiron).	3 manhole frames.
4 pieces 36-inch curvature pipe.	9 manhole covers.
5 pieces 30-inch curvature pipe.	4 12x6-inch sleeves and gate, Smith patent.
5 pieces 24-inch curvature pipe.	3 8x6-inch sleeves and gate, Smith patent.
4 pieces 20-inch curvature pipe.	2 8x4-inch sleeves and gate, Smith patent.
2 pieces 16-inch curvature pipe.	4 6x6-inch sleeves and gate, Smith patent.
4 pieces 12-inch curvature pipe.	6 6x4-inch sleeves and gate, Smith patent.
1 piece 8-inch curvature pipe.	2 6x2-inch sleeves and gate, Smith patent.
32 pieces 6-inch curvature pipe.	1 4x2-inch sleeve and gate, Smith patent.
20 pieces 4-inch curvature pipe.	32 washers for open sleeve..
2 36-inch sleeves.	2180 pounds pig lead.
1 30-inch sleeve.	88 feet 8-inch pipe (wrought iron).
4 24-inch sleeves.	5 feet 6-inch pipe (wrought iron).
2 20-inch sleeves.	12 feet 4-inch pipe (wrought iron).
2 16-inch sleeves.	21 feet 3-inch pipe (wrought iron).
3 12-inch sleeves.	34 pounds hemp packing.
5 8-inch sleeves.	140 pounds yarn.
6 6-inch sleeves.	4 pounds oakum.
15 4-inch sleeves.	2 pounds resin.
1 30-inch open sleeve.	1 piece 36-foot pine pile.
1 24-inch open sleeve.	6 telephone poles.
1 20-inch open sleeve.	1600 bricks.
2 16-inch open sleeves.	9 cement tiles.
1 12-inch open sleeve.	3 1/2 barrels cement.
2 8-inch open sleeves.	1 1/2 rolls tar paper.
3 6-inch open sleeves.	1/2 barrel rock salt.
7 4-inch open sleeves.	50 pounds rivets.
1 6x6x6-inch open sleeve.	8 wire cable couplings.
2 36-inch plugs.	2 coils 1-inch wire rope.
1 24-inch plug.	1/2 barrel black enamel paint.
4 20-inch plugs.	135 pounds 20-p. nails.
2 16-inch plugs.	52 pounds 8-p. nails.
11 12-inch plugs.	1 gallon linseed oil.
9 8-inch plugs.	11 pieces 8-inch earthenware pipe.
25 6-inch plugs.	1 60-gallon oil tank.
22 4-inch plugs.	1 lot old sheet iron.
1 30x6-inch 4-way branch.	1 lot old brass (365 lbs.)
1 24x12-inch 4-way branch.	23 pieces of sheeting, 2x8, 10 feet long.
1 24x6-inch 4-way branch.	37 pieces of sheeting, 2x10, 8 1/4 feet average length.
2 24x4-inch 3-way branches.	9 pieces of sheeting, 2x12, 13 1/2 feet average length.
1 16x16-inch 4-way branch.	1 piece of sheeting, 3x12, 8 feet long.
1 16x12-inch 4-way branch.	9 pieces of timber, 6x8, 14 feet average length.
1 16x12-inch 3-way branch.	2 pieces of timber, 6x12, 12 feet long.
1 16x6-inch 4-way branch.	2 pieces of timber, 8x10, 12 feet long.
1 16x6-inch 3-way branch.	2 pieces of timber, 10x12, 16 feet average length.
2 16x4-inch 3-way branches.	3 pieces of timber, 12x12, 8 feet average length.
1 16x3-inch 3-way branch.	1 piece oak timber, 6x6, 7 feet long.
1 12x12-inch 4-way branch.	
2 12x12-inch 3-way branches.	
3 12x6-inch 4-way branches.	
6 12x6-inch 3-way branches.	
1 12x4 4-way branch.	
1 12x4 3-way branch.	
1 8x6 4-way branch.	
3 8x6 3-way branches.	
3 8x4 3-way branches.	
11 6x6 4-way branches.	
15 6x4 4-way branches.	
1 6x4 3-way branch.	
6 6x3 3-way branches.	
7 4x4 4-way branches.	
16 4x4 3-way branches.	
2 4x3 3-way branches.	

PIPE-LAYING TOOLS.—Continued.

1 pair rock grabbing hooks.	2 ratchets.
2 steel rock-wedges.	1 pair of calipers.
4 dogs, 1 to 3 feet long.	1 pair of steel compasses.
2 puddling bars, with wrench.	1 steel square.
3 pipe chains for 12 20-inch pipe.	1 Anvil.
2 pipe scrapers.	1 draw knife.
5 6-inch logging caps.	2 branding irons.
3 dirt scrapers.	1 iron bar.
1 drag rake.	4 wooden blocks and falls.
17 dirt rammers.	150 feet 1-inch rope.

CONNECTION STOCK AND TOOLS.

5258 pounds $\frac{1}{2}$ to $1\frac{1}{2}$ -inch lead pipe, extra strong.	4 $1\frac{1}{2}$ -inch stop and waste valves.
250 feet $1\frac{1}{2}$ -inch galvanized pipe.	154 Bingham & Morgan stop boxes.
714 feet $1\frac{1}{4}$ -inch galvanized pipe.	2 sample stop boxes.
668 feet $\frac{3}{4}$ -inch galvanized pipe.	1 sample wrought iron stop box.
60 feet $\frac{1}{4}$ -inch tin pipe, for thawing out services.	3 wrought iron stop boxes.
28 pounds solder.	1 lot condemned stop boxes.
8 2-inch plugs.	1 Valve rod for turning on and shutting off water.
10 $1\frac{1}{2}$ -inch plugs.	7 folding stop cock rods.
7 $1\frac{1}{4}$ -inch plugs.	6 straight stop cock rods.
12 1-inch plugs.	6 stop cock poles.
36 $\frac{3}{4}$ -inch plugs.	6 stop box covers for asphalt paved streets.
15 $\frac{1}{2}$ -inch plugs.	3 extra special covers for stop boxes.
2 $1\frac{1}{2} \times \frac{1}{2}$ -inch Ts.	2 sand rock connection drills.
6 $1\frac{1}{4} \times \frac{1}{2}$ -inch Ts.	1 sandrock auger.
3 $1 \times \frac{1}{2}$ -inch Ts.	12 drill hole scrapers.
1 2-inch union.	6 scoopers.
3 $1\frac{1}{4}$ -inch unions.	3 dirt augers.
1 $\frac{3}{4}$ -inch union.	4 pairs 2-inch extension pipe tongs.
1 $1\frac{1}{2}$ -inch brass nipple.	2 pairs $1\frac{1}{2}$ -inch extension pipe tongs.
3 1-inch brass nipples.	4 pairs 1-inch extension pipe tongs.
40 1-inch corporation cocks.	1 crow foot for tapping mains.
13 $\frac{3}{4}$ -inch corporation cocks.	1 tap handle.
27 $\frac{5}{8}$ -inch corporation cocks.	2 Mueller tapping machines, complete with taps and drills from $\frac{3}{4}$ to 1 inch.
27 $\frac{1}{2}$ -inch corporation cocks.	2 Plumber's furnaces.
1 2-inch stop and waste cock.	1 kit plumbing tools, complete.
16 1-inch stop and waste cocks.	4 rimmers, 1 to 2 inch.
40 $\frac{3}{4}$ -inch stop and waste cocks.	6 taps and drills, from 1 3-16 to 2-inch.
42 $\frac{5}{8}$ -inch stop and waste cocks.	
15 2-inch Chapman valves.	
1 2-inch check valve.	
30 2-inch old valves.	
4 $1\frac{1}{4}$ -inch valves.	
8 $1\frac{1}{2}$ -inch stop and waste valves.	

STABLE AND MISCELLANEOUS ACCOUNT.

4 horses.	5 buckets.
1 large truck for hauling 20 to 36-inch pipe (4-wheeled).	7 wheelbarrows.
1 large truck for hauling 12 to 20-inch pipe (2-wheeled).	3 wheelbarrows, for tunnel use.
1 light truck.	2 2-wheeled pipe trucks.
2 light wagons.	14 brooms.
2 buggies.	2 steel brooms.
2 light bob sleighs.	1 writing desk.
3 cutters.	4 1-gallon cans.
4 sets single harness.	1 5-gallon can.
6 horse blankets.	2 pairs window sash.
22 pairs bedding blankets.	1 beam scale.
4 robes.	2 platform scales.
2 manure forks.	5 kerosene barrels (empty).
Small quantity of feed for horses.	1 spade.
2 farmer's kettles.	1 garden hose.
1 curry comb and brushes.	1 plow.
1 box wood stove.	1 sod cutter.
10 pairs rubber boots.	1 roller toboggan, with 1000 feet $\frac{1}{2}$ -inch rope.
18 lanterns.	1 well measure windlass.
26 lamp globes.	2 tape lines.
2 tents.	1 log hook.
1 grindstone.	2 drag forks.
	3 pairs of grab tongs.

Second—That a weir be put in at the Vadnais lake pumping plant, in order to measure more accurately the work of the pumps, and to prevent the sand pumped from the artesian wells from getting into the conduit.

Third—That a proper connection be made between Centerville lake and Peltier lake, to enable us to utilize to better advantage the water of these two lakes in pumping over from the Rice lake system.

Fourth—That a new outlet be constructed at Pleasant lake, with a weir to measure the water taken from this lake.

Fifth—That steps be taken to purchase a dredge to be used on Centerville lake and Peltier lake, to further improve these lakes as storage reservoirs, and that the necessary land be taken about these two lakes so that the Board of Water Commissioners shall have power to hold the water at elevation 190, city base, and to control the water by a dam at the outlet of Lake Peltier.

Respectfully submitted,

L. W. RUNDLETT,
City Engineer.

WEST ST. PAUL PUMP STATION.

Amount of water pumped.....	(gallons)	13,497,120
Amount of fuel consumed.....	(pounds)	212,100
Average rate of pumping.....	(in 24 hours)	36,877
Average duty during the year.....		11,078,774

		Cost of Raising 1,000,000 Gallons 1 Foot.
Salaries for 1896.....	\$1,430.00	\$0.50695
Fuel	475.17	0.16844
Waste, oil and repairs.....	49.95	0.01770
Total		\$0.69309

VADNAIS PUMP STATION.

Amount of water pumped.....	(gallons)	1,989,020,366
Amount of coal consumed.....	(pounds)	612,614
Average duty during the year.....		49,040,178

		Cost of Raising 1,000,000 Gallons 1 Foot.
Salaries for 1896.....	\$1,147.48	\$0.03458
Fuel	1,380.53	0.04160
Waste, oil and repairs.....	115.50	0.00348
Total		\$0.07966

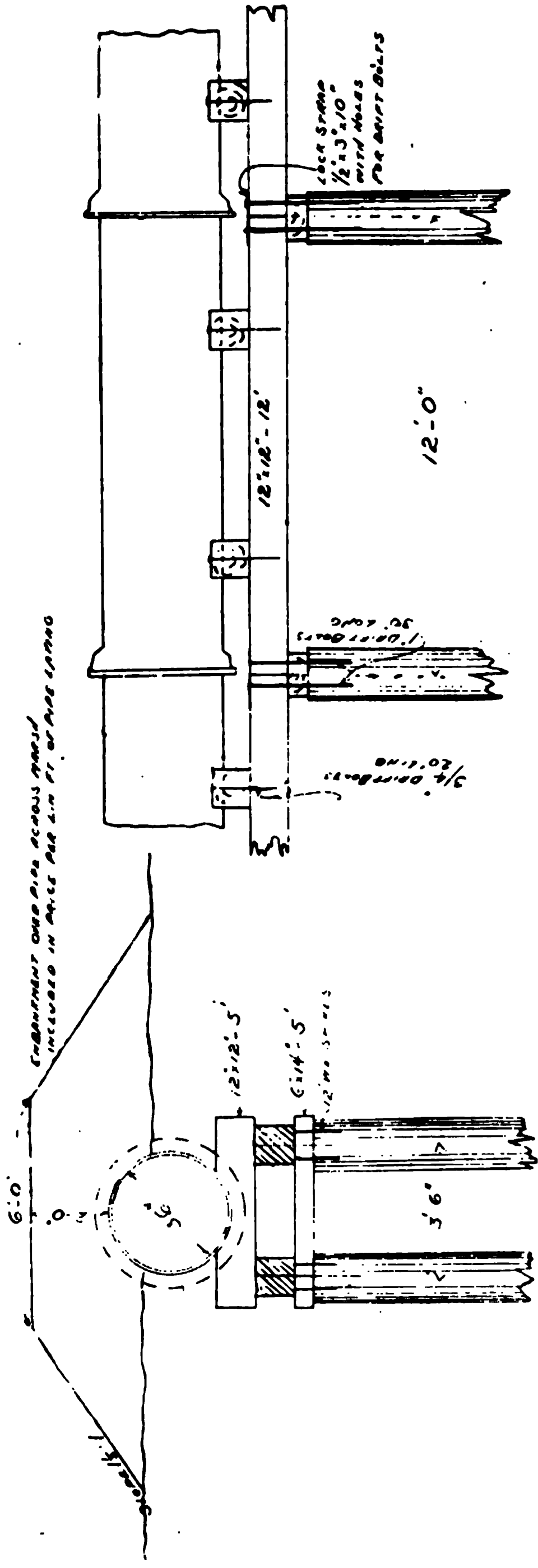
About twenty tons of coal have been used for construction and other purposes.

PRECIPITATION AT ST. PAUL.

FROM DECEMBER 1, 1895, TO JANUARY 1, 1897.

1895.		1896.	
December	0.38	June	3.30
1896.		July	1.12
January	0.81	August	4.48
February	0.17	September	2.45
March	2.93	October	3.89
April	5.63	November	5.07
May	4.67	December	0.71

PLAN OF PILE FOUNDATION ACROSS MARSH, FROM STA. 5 TO STA. 17 ABOUT.



ST. PAUL WATER WORKS' PUMPING STATION, WEST SIDE.
ENGINEER'S REPORT FOR THE YEAR ENDING DECEMBER 31, 1896.

Months.	Number of Hours Pumped.	Total Number of Revo- lutions.	Total Number of Gallons Pumped.	Average Per Day Pumped.	Total lbs. of Coal Used.	Average lbs. Coal Per Day.	Pressure lbs.
189							
Decem							
189							
Janua							
Febru							
March							
April.							
May .							
June..							
July..							
Augus							
Septen							
Octobe							
Novem							
Decem							
<u>Tot</u>							

Total number of gallons pumped	13,497,120
Daily average.....	33,821
Total pounds of coal used.....	212,100
Daily average.....	585
Daily increase since 1895.....	5,285

ST. PAUL WATER WORKS' PUMPING STATION, VADNAIS LAKE.

ENGINEER'S REPORT FOR THE YEAR ENDING DECEMBER 31, 1896.

MONTHS.	No. of Hours Pumped.	Total Number of Revolu- tions.	Total Number of Gallons Pumped.	Average Per Day Pumped.	Total Lbs. of Coal Used.	Average Coal Used Per Day.	Average Pressure on Suct'n.
1896.							
January.....	674 3/4	1,453,841	127,038,064	4,127,034	72,244	2,330	.....
February.....	336 1/4	1,552,621	136,630,648	4,711,401	72,900	2,514	.....
March.....	702	1,659,688	146,052,544	4,711,373	81,500	2,629	.....
April.....	599	1,405,431	123,677,928	4,947,117	75,790	3,031	.....
May.....							.....
June.....							.....
July.....	224	528,082	46,524,016	5,145,000	27,200	2,720	.....
August.....	730 3/4	1,743,183	153,400,104	4,948,616	89,200	2,878	.....
September.....	604	1,643,083	144,591,304	4,819,710	87,000	2,900	.....
October.....	680	1,627,178	143,191,664	4,619,086	86,700	2,793	.....
November.....	165	396,278	34,872,244	4,981,749	20,060	2,868	.....
December.....							.....
Total	4,765	12,009,985	1,056,878,516	4,779,009	612,614	2,740	10 lbs

Total number of gallons pumped 1,056,878,516

Daily average gallons pumped 4,779,009

Total pounds of coal used..... 612,614

Daily average pounds of coal used 2,740

Average pressure on suction..... 10 lbs.

CITY TREASURER'S REPORT.

OFFICE OF THE CITY TREASURER,
ST. PAUL, MINN., Feb. 26, 1897.

To the Honorable the President and Members of the Board of Water Commissioners,

GENTLEMEN: I have the honor to submit to you the following report of the receipts and disbursements of the Water Department Fund and the Water Department Sinking Fund for the fiscal year ending Dec. 31, 1896.

Respectfully,
C. L. HORST,
City Treasurer.

Balance on hand Dec. 1, 1895..... \$48,671.22

Cash received from John Caulfield—

Dec. 7, 1895.....	\$1,000.00
Dec. 10, ".....	1,000.00
Dec. 11, ".....	2,000.00
Dec. 14, ".....	1,000.00
Dec. 19, ".....	2,500.00
Dec. 26, ".....	1,000.00
Dec. 27, ".....	1,000.00
Jan. 7, 1896.....	10,000.00
Jan. 10, ".....	5,000.00
Jan. 14, ".....	5,000.00
Jan. 17, ".....	1,000.00
Jan. 18, ".....	1,000.00
Jan. 22, ".....	2,000.00
Jan. 29, ".....	1,000.00
Jan. 31, ".....	1,000.00
Feb. 6, ".....	5,000.00
Feb. 10, ".....	1,000.00
Feb. 13, ".....	2,000.00
Feb. 17, ".....	1,000.00
Feb. 19, ".....	1,000.00
Feb. 21, ".....	1,000.00
Feb. 24, ".....	1,000.00
Feb. 25, ".....	2,000.00
Feb. 28, ".....	2,000.00
Feb. 29, ".....	4,000.00
Mar. 7, ".....	10,000.00
Mar. 10, ".....	10,000.00
Mar. 12, ".....	2,000.00
Mar. 13, ".....	2,000.00
Mar. 17, ".....	2,000.00
Mar. 17, " Frontage tax.....	14,435.28
Mar. 21, ".....	1,000.00

SIXTEENTH ANNUAL REPORT

OF THE

BOARD

OF

WATER COMMISSIONERS

OF THE

CITY OF ST. PAUL.

JANUARY 1, 1898.

ST. PAUL, MINN.:
THE PIONEER PRESS COMPANY.
1898.

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SIXTEENTH ANNUAL REPORT

OF THE

BOARD

OF

WATER COMMISSIONERS

OF THE

CITY OF ST. PAUL.

JANUARY 1, 1898.

**ST. PAUL, MINN.:
THE PIONEER PRESS COMPANY
1898.**

OFFICERS
OF THE
CITY WATER WORKS.
JANUARY 1, 1898.

BOARD OF WATER COMMISSIONERS.

R. B. C. BEMENT, President. Term expires Jan. 1, 1901.
JOHN H. WOLTERSTORFF. Term expires Jan. 1, 1901.
J. F. HOYT. Term expires Jan. 1, 1900.
P. W. HUDNER. Term expires Jan. 1, 1902.
THOS. GRACE. Term expires Jan. 1, 1899.

JOHN CAULFIELD, Secretary.
A. R. STARKEY, Superintendent.
L. W. RUNDLETT, City Engineer and Engineer of the Board.
MARTIN FEIST, Chief Engineer and Engineer of McCarron Lake Station.
M. THOMMES, Assistant Engineer of McCarron Lake Station.
H. GEISLER, Gate Keeper and Engineer of Vadnais Lake Station.
A. A. THOMPSON, Assistant Engineer of Vadnais Lake Station.
JACOB ABRESCH, Engineer of Centerville Station.
JOS. DOERR, Engineer of West St. Paul Station.
FRANK GALLOWAY, Assistant Engineer of West St. Paul Station.
GEO. DOORLEY, Meter Inspector.

thousand five hundred and twenty-five dollars and eight cents (\$461,525.08) in Water Department sinking fund to date; and the total cost of the works to the city, January 1st, 1898, is three million, eight hundred fifteen thousand six hundred and sixty-one dollars and sixteen cents (\$3,815,661.16). This matter is brought up only for the purpose of explaining the discrepancy of one million three hundred fourteen thousand one hundred and eight dollars and eighty-four cents (\$1,314,108.84) between the actual cost of the works to the city and that stated by the City Comptroller, that it may be a matter of record, and accounted for when both reports are printed together in the single volume of the annual reports of the city for the year.

In the report of the City Engineer, herewith appended, you will notice that the average rainfall for the year ending December 31st, 1897, was 30.52 inches, or 3.07 inches greater than the average rainfall up to December 31st, 1896, and 4.21 inches less than the rainfall of the previous year. The rainfall for the year just ended, by months, was generally below the average, but the months of June and July were very large, and greatly in excess of the monthly average, occurring most opportunely, as it filled our lakes nearly to the overflowing point just before the period when our greatest drain upon them began. And for this reason we were not obliged to use our reserve supply, and practically our Centerville and Baldwin Lake plants were not used during the year, except occasionally for testing purposes.

The quality of the water was very satisfactory this year, a fact confirmed by the analyses of the water and the comparatively few complaints from the consumers.

A break occurred in the old force main extending from the McCarron Lake pumping station to the High Service reservoir, on the Rice street embankment, where we had so much trouble last year, but this break was discovered immediately, water was shut off, and very little damage occurred. The necessity for, and the advantage of, having this auxiliary force main to the reservoir was shown. This main was completed early in the Spring and its value was thus demonstrated.

Your attention is called to the increase in the number of water meters in use, fully fifty (50) per cent, and a continuation of the policy of increasing the use of meters is urged. In the Engineer's report this subject has been investigated, and at the end of the present year we hope to have the figures to show more accurately the amount of water required in this locality per capita. From what we have already compiled, it is shown that only about thirty-five (35) gallons are used per capita, as against fifty (50) gallons and upwards, as shown by the unmetered consumers of water.

Since the reduction in the charges for water to both metered and unmetered consumers, seven months only of this year, were affected by the reduction. Six months unmetered consumers, and eight months metered consumers, show a surplus of seven thousand nine hundred and thirty-five dollars and twenty-nine cents (\$7,935.29), over the cost to the depart-

SECRETARY'S REPORT.

OFFICE OF THE BOARD OF WATER COMMISSIONERS,
ST. PAUL, MINN., Jan. 1, 1898.

To the Board of Water Commissioners,

GENTLEMEN: I herewith submit my sixteenth annual report, with accompanying statements and tables, showing in detail under appropriate headings the financial operations of the Water Department for the year ending Dec. 31, 1897; also, comparative statements of receipts and disbursements from Aug. 10, 1882 (the time of the purchase of the works by the city), to date.

REVENUE. (See Table No. 2.)

Balance on hand Jan. 1, 1897.....	\$10,058.17
General water receipts.....	\$170,796.35
Miscellaneous water receipts.....	14,265.85
Connections (street services).....	9,174.09
Extensions	1,627.12
Construction (new supply).....	2,000.00
Frontage tax	106,448.35
Shutting off and turning on water.....	29.00
Sinking fund earnings.....	21,759.17
Sinking fund	824.80
Meter	87.01
	<hr/>
	327,011.74
Total	<hr/>
	\$337,069.91

DISBURSEMENTS. (See Table No. 2.)

General maintenance	\$37,105.41
Connection (street services).....	10,015.19
Repairs	2,408.63
Meters	9,324.50
Extensions	23,305.72
Construction	27,885.79
Interest	114,200.00
Frontage tax refunded.....	136.27
Sinking fund	96,759.17
Sinking fund earnings.....	824.80
	<hr/>
	\$321,965.48
Balance	<hr/>
	\$15,104.43

GENERAL MAINTENANCE ACCOUNT.

Thirty-seven thousand one hundred and five dollars and forty-one cents (\$37,105.41) was paid on this account. The expense of maintaining the five pumping stations and Dale street reservoir was thirteen thousand nine hundred and sixty-one dollars and seventy-eight cents (\$13,961.78) (see Table No. 13), of which six thousand nine hundred and fifty-seven dollars and fifty cents (\$6,957.50) was for salaries, six thousand four hundred and ninety-three dollars and ninety-seven cents (\$6,493.97) for fuel, two hundred and eighty-five dollars and thirty-two cents (\$285.32) for waste and machine oils, one hundred and ninety-four dollars and four cents (\$194.04) for supplies and repairs, and thirty-dollars and ninety-five cents (\$30.95) for kerosene oil, leaving a balance of twenty-three thousand one hundred and forty-three dollars and sixty-three cents for salaries and labor of all the officers, employes, office expenses, fuel and all other expenses necessary for maintaining the works. (See Table No. 17 for comparative statements of the expenses of maintaining the pumping stations and reservoirs for the past seven years.)

EXTENSION ACCOUNT.

Twenty-three thousand three hundred and five dollars and seventy-two cents (\$23,305.72) was paid on account of city extensions, of which eight thousand seventy-seven dollars and eleven cents (\$8,077.11) was for pipe and specials; ten thousand two hundred and eighteen dollars and sixty-nine cents (\$10,218.69) was for labor; and ten hundred seventy-six dollars and fifty cents (\$1,076.50) for fire hydrants; one thousand nine hundred and ninety-one dollars and sixty-nine cents (\$1,991.69) for valves, and one thousand nine hundred and forty-one dollars and seventy-three cents (\$1,941.73) for tools, lead and hemp packing, and lumber and material.

CONSTRUCTION ACCOUNT.

Twenty-seven thousand eight hundred and eighty-five dollars and seventy-nine cents (\$27,885.79) was paid on this account. This was principally for work done on the Centerville conduit and pumping stations, and the artesian well plant at Vadnais lake station.

PAY ROLL. (See Table No. 11.)

All of the work in laying water pipes the past season was done under contract. The putting in of service pipes, additional fire hydrants, valves and street sprinkling hydrants was done by day labor; also, considerable work at the various pumping stations, lakes and canals. The pay roll of all officers and employes for the year amounted to forty-five thousand three dollars and thirty-four cents (\$45,003.34), and the monthly average of employes has been ninety-five (95).

TABLE NO. 1.

TRIAL BALANCE, DEC. 31, 1897.

Account.	Dr.	Cr.
St. Paul Water Works (original purchase).....	\$510,000.00	
Bond account		\$2,460,000.00
General water receipts.....		2,221,488.02
Miscellaneous water receipts.....		267,296.99
Connection (services)		5,319.19
Extension	1,983,305.39	
General maintenance	433,372.31	
Repair	56,160.79	
Meter	59,202.04	
Construction	1,263,153.73	
Interest	1,404,742.61	
General water receipts (hydrant account).....		121,663.19
Sinking fund	461,525.08	
Sinking fund earnings.....		67,861.89
Shutting off and turning on water.....		2,236.00
Frontage tax		1,040,701.10
Bank of Minnesota.....	282.10	
C. L. Horst, city treasurer.....	14,822.33	
	<hr/>	<hr/>
	\$3,186,566.38	\$3,186,566.38

TABLE NO. 2.

RECEIPTS AND DISBURSEMENTS FROM JAN. 1, 1897, TO DEC. 31, 1897

Balance Jan. 1, 1897.....			\$10,058.1
General water receipts, high service..	\$65,863.38		
General water receipts, low service...	42,616.68		
General water receipts, meters.....	62,313.31		
		\$170,796.35	
Miscellaneous receipts, builders.....	\$448.31		
Miscellaneous receipts, water carts...	.....	
Miscellaneous receipts, flushing sewers	344.77		
Miscellaneous receipts, filling cisterns.	196.50		
Miscellaneous receipts, sprinkling streets	13,276.27		
		\$14,265.85	
Connections—(Services)		9,174.09	
Extension		1,627.12	
Construction (new supply)		2,000.00	
Frontage tax		106,448.35	
Shutting off and turning on water....		29.00	
Sinking fund earnings.....		21,759.17	
Sinking fund		824.80	
Meter		87.01	
			\$327,011.7
Total receipts			\$337,069.1

DISBURSEMENTS.

General Maintenance—			
Salaries	\$20,571.80		
Stationery and printing.....	1,833.17		
Miscellaneous	843.24		
Labor	5,397.10		
Material	7,701.22		
Stable—feed	258.84		
Stable—repairs	500.04		
		\$37,105.41	
Connections—			
Labor	\$6,330.68		
Pipe	1,821.51		
Brass goods and stop boxes.....	1,521.85		
Tools and miscellaneous	341.15		
		\$10,015.19	
Repairs—			
Hydrants—labor	\$1,735.98		
Hydrants—material	89.23		
Valves—labor	201.26		
Valves—material .....	.....	
Mains—labor	375.66		
Mains—material	6.50		
		\$2,408.63	
Meters—			
Labor	\$2,661.53		
Freight and meters.....	6,662.97		
		\$9,324.50	
Extensions—			
Pipe and special castings.....	\$8,077.11		
Labor and contracts.....	10,218.69		
Tools and repairs of same.....	211.78		
Advertising	18.04		
Fire hydrants	1,076.50		
Valves	1,991.69		
Lead and hemp packing.....	589.44		
Lumber and material.....	764.85		
Miscellaneous	357.62		
		\$23,305.72	
Construction—New Supply—			
Pipe and special castings.....	\$732.62		
Labor and contracts.....	20,700.77		
Tools and repairs of same.....	2,001.25		
Lumber and material.....	3,231.58		
Freight	104.51		
Engineering and right of way.....	929.21		
Miscellaneous and building account..	185.85		
		\$27,885.79	
Interest		\$114,200.00	
Refunded frontage tax.....		136.27	
Sinking fund		96,759.17	
Sinking fund earnings.....		824.80	
Total disbursements			\$321,965.4
Balance			\$15,104.4

TABLE NO. 3.

RECEIPTS AND DISBURSEMENTS FROM AUG. 10, 1882, TO DEC. 31, 1897.

General water receipts, high service..	\$616,393.59	
General water receipts, low service...	919,352.83	
General water receipts, meters.....	685,741.60	
	<hr/>	\$2,221,488.02
Miscellaneous receipts, builders.....	\$37,916.11	
Miscellaneous receipts, water carts...	3,796.13	
Miscellaneous receipts, flushing sewers	11,916.39	
Miscellaneous receipts, filling cisterns.	20,518.59	
Miscellaneous receipts, sprinkling streets	193,149.77	
	<hr/>	\$267,206.99
Connections—(Services)	\$301,554.56	
Extension....	32,962.85	
Interest	67,964.84	
Meter	145.61	
Frontage tax	1,043,389.14	
Sinking fund	8,775.22	
Shutting off and turning on water....	2,236.00	
Sinking fund earnings.....	73,885.33	
Repairs	3,259.15	
General water receipts, hydrant ac- count	121,663.19	
Construction	5,694.26	
Bills payable	653,000.00	
Bonds	2,110,000.00	
Total receipts	<hr/>	\$6,913,315.16

TABLE NO. III—Continued.

DISBURSEMENTS.

Maintenance—		
.....	\$235,426.87	
printing.....	16,457.41	
.....	9,225.39	
.....	62,061.87	
.....	100,587.81	
.....	5,098.23	
.....	3,899.73	
	<hr/>	\$433,872.31
Connections—		
Labor	\$160,258.78	
Pipe	77,851.99	
Brass goods and stop boxes.....	40,538.10	
Tools and miscellaneous	8,586.50	
	<hr/>	\$286,235.37
Repairs—		
.....	\$37,782.05	
.....	1,818.98	
.....	1,450.65	
.....	547.02	
.....	13,565.69	
.....	2,265.55	
	<hr/>	\$59,419.94
Meters—		
Labor	\$18,945.78	
Freight and meters.....	40,381.87	
	<hr/>	\$59,347.65
Extensions—		
.....	\$1,066,796.12	
.....	632,348.53	
.....	20,058.03	
.....	852.06	
.....	98,575.73	
.....	79,721.22	
.....	67,644.23	
.....	23,525.43	
.....	25,861.84	
	<hr/>	\$2,016,268.24
.....		
.....	\$187,709.83	
.....	677,007.64	
.....	7,375.94	
.....	93,709.18	
Freight	9,583.73	
Engineering	126,740.76	
Miscellaneous	19,146.55	
Reservoirs	147,484.77	
	<hr/>	\$1,268,847.90
Interest		\$1,472,707.45
Refunded frontage tax.....		2,688.04
Bills payable		653,000.00
Bond		180,000.00
Sinking fund		468,924.41
Sinking fund earnings.....		7,399.33
		<hr/>
Total disbursements		\$6,806,210
Balance		\$15,104

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TABLE NO. IV.—Continued.

July 7....	Cash.....	\$10,000.00	
July 9....	Cash.....	5,000.00	
July 13....	Cash.....	3,000.00	
July 19....	Cash.....	2,000.00	
July 23....	Cash.....	1,000.00	
July 28....	Cash.....	1,000.00	
July 29....	From county treasurer on account of frontage tax	23,461.12	
July 31....	Cash.....	1,000.00	
			\$46,461.12
Aug. 5....	Cash.....	\$1,000.00	
Aug. 7....	Cash.....	1,000.00	
Aug. 11....	Cash.....	1,000.00	
Aug. 12....	Cash.....	1,000.00	
Aug. 17....	Cash.....	1,000.00	
Aug. 19....	Cash.....	1,000.00	
Aug. 20....	Cash.....	1,000.00	
Aug. 23....	Cash.....	1,000.00	
Aug. 27....	Cash.....	1,000.00	
Aug. 30....	Cash.....	2,000.00	
			\$11,000.00
Sept. 3....	Cash.....	\$5,000.00	
Sept. 7....	Cash.....	10,000.00	
Sept. 10....	Cash.....	5,000.00	
Sept. 11....	Cash.....	2,000.00	
Sept. 13....	Cash.....	2,000.00	
Sept. 14....	Cash.....	3,000.00	
Sept. 16....	Cash.....	2,000.00	
Sept. 18....	Cash.....	2,000.00	
Sept. 22....	Cash.....	1,000.00	
Sept. 24....	Cash.....	2,000.00	
Sept. 27....	Cash.....	1,000.00	
			\$35,000.00
Oct. 4....	Cash.....	\$2,000.00	
Oct. 6....	Cash.....	2,000.00	
Oct. 11....	Cash.....	1,000.00	
Oct. 12....	Cash.....	1,000.00	
Oct. 14....	Cash.....	2,000.00	
Oct. 20....	Cash.....	1,000.00	
Oct. 22....	Cash.....	1,000.00	
Oct. 26....	Cash.....	500.00	
Oct. 27....	Cash.....	500.00	
			\$11,000.00
Nov. 4....	Cash.....	\$1,000.00	
Nov. 6....	Cash.....	1,000.00	
Nov. 9....	Cash.....	1,000.00	
Nov. 11....	Cash.....	1,000.00	
Nov. 16....	Cash.....	2,000.00	
Nov. 19....	Cash.....	1,000.00	
Nov. 20....	From county treasurer on account of frontage tax	6,545.99	
Nov. 29....	Cash.....	1,000.00	
			\$14,545.99
Dec. 4....	Cash.....	\$1,000.00	
Dec. 6....	Cash.....	1,000.00	
Dec. 13....	Cash.....	1,000.00	
Dec. 16....	Cash.....	1,000.00	
Dec. 22....	Cash.....	1,000.00	
Dec. 28....	Cash.....	1,510.76	
			\$6,510.76
			\$304,459.11
Total			\$314,203.84

TABLE NO. 6.

CONTRACTS MADE BY THE BOARD OF WATER COMMISSIONERS FROM
JAN. 1, 1897, TO DEC. 31, 1897.

No.	Date of Contract.	With Whom and for What Purpose.	Am't of Contract.	Amount Paid.	Amount Due.
1	Feb. 10.	Lyle M. Fisher, printing annual report for 1896.....	\$335.80	\$335.80	
2	Mar. 27.	The Crane & Ordway Co., brass goods	529.60	529.60	
3	Mar. 27.	The Crane & Ordway Co., lead pipe and block tin.....	1,573.61	1,573.61	
4	Mar. 30.	Dwyer Plumbing & Heating Co., stopcock boxes.....	943.50	943.50	
5	April 1.	Bingham & Taylor, Buffalo, N. Y., valve boxes	613.78	613.78	
6	April 24.	Joseph Lamotte, fencing right of way, Centerville.....	703.71	703.71	
7	May 5.	E. P. Allis & Co., Milwaukee, Wis., 10-million engine, McCarron station	22,700.00		\$22,700.00
8	May 22.	Henry Orme, special castings for city extensions	664.75	664.75	
9	May 22.	Fairbanks, Morse & Co., laying water mains on Smith avenue between Goodrich and McBoal.....	651.00	585.90	65.10
10	May 22.	Fairbanks, Morse & Co., laying and re-laying water mains.....	4,826.65	4,343.99	482.66
11	May 22.	P. H. Thornton, laying water mains	422.67	380.40	42.27
12	May 22.	South Park Foundry & Machine Co., fire hydrants.....	788.50	788.50	
13	May 22.	South Park Foundry & Machine Co., water gates	1,020.50	1,020.50	
14	June 4.	Chas. A. Fuller, 8 tons pig lead....	518.98	518.98	
15	June 3.	Jas. Shiely, drayage.....	282.71	226.17	56.54
16	Mar. 26.	Pittsburg Meter Co., Pittsburg, Pa., water meters	5,442.00	4,966.00	476.00
17	June 3.	South Pittsburg Pipe Works, South Pittsburg, Tenn., cast iron pipe..	7,154.11	7,154.11	
18	May 27.	Robert W. Hunt & Co., Chicago, Ill., inspecting 10-million pump, McCarron station	800.00		800.00
19	June 4.	South Park Foundry & Machine Co., sprinkling attachment for hydrants, sluice gate and special flange connection	545.30	545.30	
20	July 1.	N. W. Fuel Co., coal and wood....	4,780.00	1,180.75	3,599.25
21	July 6.	Gillette-Herzog Mfg. Co., Minneapolis, weir tank, high service reservoir	400.00	400.00	
22	Aug. 25.	Builders' Iron Foundry, Providence, R. I., Venturi meter, 30-inch....	1,151.75		1,151.75
23	Aug. 27.	W. H. Jackson, White Bear, dwelling house, Centerville.....	1,474.00	1,474.00	
24	Oct. 23.	Jno. Kenny, boiler for McCarron station	1,223.00		1,223.00
25	Oct. 25.	Howard-Harrison Iron Co., cast iron specials	945.50		945.50
26	Dec. —.	G. F. Moulton, 25,000 paving brick.	350.00		350.00
27	Dec. 6.	Kettle River Sandstone Co., stone for 10-million gallon pumping engine	548.00		548.00
			\$61,389.42	\$28,949.35	\$32,440.07

TABLE NO. 6.—Continued.

CONTRACTS MADE PREVIOUS TO DEC. 31, 1896, AND FOR WHICH FINAL SETTLEMENT WAS NOT MADE AT TIME OF LAST REPORT.

Date of Contract.	With Whom and for What Purpose.	Am't Due Dec. 1, 1896	Amount Paid.	Amount Due.
July 17, 1895.	Ransome Subway Co., Chicago, conduit to Otter lake.....	\$413.29	\$413.29	
April 20, 1896.	E. P. Allis & Co., Milwaukee, pumping engine, Centerville.....	10,350.00	10,000.00	\$350.00
May 10.	J. T. Million, laying water mains on Duke street.....	114.22	114.22	
May 20.	Patrick Doherty, laying water mains in city.....	344.05	344.05	
May 20.	Hennesy & Cox, wooden conduit to Centerville.....	1,500.00		1,500.00
July 8.	Hennesy & Cox, pump house at Centerville	50.00		50.00
July 8.	John Kenny, boiler McCarron Lake station	176.50	176.50	
July 25.	Fairbanks, Morse & Co., laying 36-inch water pipes	700.61	700.61	
Sept. 28.	S. Swanson, two artesian wells at Vadnais lake	1,095.20	1,095.20	
Oct. 10.	John Kenny, smoke stack, Centerville station	270.00	270.00	
Oct. 14.	Nic. Feyen, grading on Centerville conduit	50.00	50.00	
Oct. 29.	N. W. Fuel Co., coal and wood....	4,136.42	4,136.42	
Oct. 29.	Pioneer Fuel Co., coal for Vadnais station	202.50	202.50	
		\$19,402.79	\$17,502.79	\$1,900.00

TABLE NO. 7.

BOND ACCOUNT JANUARY 1, 1898.

Date of Legislative Act Authorizing Issue of Bonds.	Amount of Bonds Au- thorized.	Date of Bonds Issued.	When Due.	Amount of Bonds Issued.	Rate.	INTEREST PAYABLE.											Total Annual Interest	
						Dec. 1.	Jan. 2.	Feb 1.	Mar. 2.	April 1.	May 2.	June 1.	July 2.	Aug. 1.	Sept. 1.	Oct. 1.		Nov. 2.
Feb. 10, 1881	\$600,000	June 1, 1882	30 years	\$350,000	4 per cent	\$7,000	.....	.....	.....	.....	.....	\$7,000	.....	.....	.....	.....	.....	\$14,000
Jan. 26, 1883	500,000	Aug. 1, 1883	30 years	150,000	5 per cent	.....	.....	\$3,750	.....	.....	.....	.....	.....	\$3,750	.....	.....	.....	7,500
Feb. 21, 1885	800,000	April 1, 1884	25 & 30 years	600,000	5 per cent	.....	.....	.....	.....	\$15,000	.....	.....	.....	.....	.....	\$15,000	.....	30,000
Jan. 31, 1887	200,000	April 1, 1885	30 years	400,000	5 per cent	.....	.....	.....	.....	10,000	.....	.....	.....	.....	.....	10,000	.....	20,000
Jan. 31, 1887	160,000	May 2, 1887	30 years	200,000	4½ per cent	.....	.....	.....	.....	.....	\$4,500	.....	.....	.....	.....	.....	\$4,500	9,000
Jan. 29, 1880	300,000	Mar. 1, 1888	30 years	300,000	4½ per cent	.....	.....	.....	\$8,750	.....	.....	.....	.....	.....	\$8,750	.....	.....	13,500
Mar.		Jan. 1, 1889	30 years	100,000	4½ per cent	.....	\$2,250	.....	.....	.....	.....	.....	\$2,250	.....	.....	.....	.....	4,500
		Jan. 2, 1890	30 years	160,000	4½ per cent	.....	3,600	.....	.....	.....	.....	.....	3,600	.....	.....	.....	.....	7,200
		May 1, 1889	30 years	100,000	4½ per cent	.....	.....	.....	.....	.....	2,250	.....	.....	.....	.....	.....	2,250	4,500
		May 1, 1890	30 years	100,000	4 per cent	.....	.....	.....	.....	.....	2,000	.....	.....	.....	.....	.....	2,000	4,000
	2,560,000			\$2,460,000		\$7,000	\$5,850	\$3,750	\$8,750	\$25,000	\$8,750	\$7,000	\$5,850	\$3,750	\$8,750	\$25,000	\$8,750	\$114,200

TABLE NO. 9.
FRONTAGE TAX ACCOUNT COLLECTIONS—BALANCE DUE JAN. 1, 1898.

RECEIPTS FOR YEARS.	1890 and Prior.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	Total.
March 16, 1897.....	\$12.09	\$17.46	\$73.18	\$17.65	\$902.01	\$7,370.47	\$3,347.48	.....	\$11,441.24
May 26, 1897.....							15,000.00	.....	15,000.00
June 26, 1897.....							50,000.00	.....	50,000.00
July 20, 1897.....			103.31	81.00	937.44	8,578.16	13,761.21	.....	23,461.12
Nov. 20, 1897.....					170.40	3,675.81	2,699.78	.....	6,545.99
Total receipts	\$12.09	\$17.46	\$170.49	\$98.65	\$1,709.85	\$19,024.44	\$84,808.47	.....	\$106,448.35
Amount due Jan. 1, 1897, as per last report	\$3,642.29	\$1,723.68	\$1,283.35	\$816.19	\$8,301.72	\$31,372.51	\$114,925.17	.....	\$162,064.91
Amount of 1897 assessment collectible in 1898								\$104,052.58	\$55,616.56 104,052.58
Amount due Jan. 1, 1898.....	\$3,629.30	\$1,708.22	\$1,103.83	\$717.54	\$6,591.87	\$11,748.07	\$30,116.70	\$104,052.58	\$159,699.14

TABLE NO. 10.
SINKING FUND INVESTMENTS IN TAX LEVY CERTIFICATES AND CITY BONDS.

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*This was invested Jan. 15, 1898, in 4% city tax levy certificates.

TABLE NO. 11.

PAY ROLL FOR YEAR INCLUDES SALARIES OF OFFICERS, ENGINEERS, FIREMEN, INSPECTORS AND LABORERS.			SALARIES OF ENGINEERS, FIREMEN AND KEEPERS AT THE VARIOUS STATIONS.						
MONTH.	No. of Men.	Total Amount of Pay Rqd.	McCarron Lake Station.	Vadnais Lake Station.	Baldwin Lake Station.	West St. Paul Station.	Centerville Station.	Reservoir.	Total.
1896. December	89	\$3,701.42	\$300.00	\$50.00	.....	\$110.00	\$120.00	\$25.00	\$605.00
1897. January	81	3,333.22	300.00	50.00	.....	110.00	81.50	25.00	566.50
February	78	3,227.09	300.00	50.00	.....	110.00	50.00	25.00	535.00
March	74	3,012.17	300.00	50.00	\$5.00	110.00	90.00	25.00	550.00
April	83	3,199.36	300.00	50.00	5.00	110.00	60.00	40.00	565.00
May	101	4,225.76	300.00	50.00	5.00	110.00	60.00	40.00	585.00
June	113	3,945.42	300.00	50.00	5.00	110.00	60.00	40.00	585.00
July	108	4,032.94	300.00	50.00	5.00	110.00	60.00	40.00	585.00
August	92	4,056.31	300.00	50.00	.....	110.00	101.00	40.00	601.00
September	106	4,188.09	300.00	110.00	.....	110.00	71.00	40.00	631.00
October	116	4,348.84	300.00	110.00	5.00	110.00	60.00	40.00	625.00
November	90	3,732.72	300.00	84.00	5.00	110.00	60.00	25.00	584.00
Total	1,140	\$45,003.34	\$3,600.00	\$754.00	\$35.00	\$1,320.00	\$843.50	\$405.00	\$8,957.50

TABLE NO. 12.

OWING TABLE SHOWS THE NUMBER OF APPLICATIONS
OR WATER SERVICES ANNUALLY FROM 1860 TO DATE.

YEAR.	High Service.	Low Service.	Total.
.....	34	2,426
.....	.....	321
.....	.....	250
.....	.....	164
.....	.....	131
.....	.....	153
.....	.....	95
.....	.....	85
.....	.....	67
.....	.....	50
.....	.....	180
.....	.....	167
.....	.....	164
.....	.....	204
.....	301	500
.....	164	336	
.....	644	365	
.....	639	369	
.....	747	325	
.....	812	406	
.....	1,327	491	
.....	1,071	336	
.....	811	264	
.....	671	210	
.....	474	151	
.....	363	139	
.....	390	311	
.....	384	156	430
.....	332	98	
	8,829	6,383	15,212

TABLE NO. 13.

PUMPING PLANTS.

MAINTAINING THE FIVE (5) PUMPING STATIONS AND RES-
ER VOIR.

	Salaries.	Fuel.	Waste and Mach. Oil.	Supplies & Repairs.	Kerosene Oil.	Total.
ke...	\$3,600.00	\$3,888.07	\$237.45	\$101.68	.....	\$7,827.20
ce...	35.00	.....	.....	.....	.....	35.00
e...	754.00	479.83	6.50	46.92	\$9.81	1,297.15
il...	1,320.00	361.22	5.36	42.86	11.60	1,741.04
.....	843.50	1,764.85	35.92	2.58	9.54	2,658.39
.....	405.00	.....	.....	.....	.....	405.00
	\$6,957.50	\$6,493.97	\$285.32	\$194.04	\$30.95	\$13,961.78

TABLE NO. 14.

METERS IN SERVICE JAN. 1, 1898.

KIND OF METER.	
Worthington (improved)...	
Worthington (old style)...	
Union (rotary).....	
Union (piston).....	
Columbia	
Nash	
Nash "A".....	
Nash "AA".....	
Crown	
Crown "AA".....	
Empire	
Empire "A".....	
Gem	
Thomson	
Thomson "B".....	
Lambert	
Lambert "A".....	
Hersey	
Hersey disc.....	
Frost	
Trident	
Westinghouse	
Pittsburg disc.....	406 8 11
Totals	15 1,000 215 189

TABLE NO. 15.

Shut off and Turned on water from Jan. 1, 1897, to Jan. 1, 1898.

	High Service.	Low Service.	Total.
Shut off for repairs.....	248	250	498
Shut off for non-payment.....	232	190	422
Shut off for vacant premises	641	475	1,116
Shut off for violation of rules.....	5	5	10
Totals	1,126	920	2,046
Turned on old services.....	1,004	839	1,843
Turned on new services.....	329	103	432
Turned on for builders			24
Totals	1,423	942	2,365

Total services shut off and turned on for year ending:

December 1, 1894.....	1,014	December 1, 1891.....	4,743
December 1, 1895.....	2,311	December 1, 1892.....	4,470
December 1, 1896.....	2,384	December 1, 1893.....	4,477
December 1, 1897.....	2,541	December 1, 1894.....	4,932
December 1, 1898.....	2,833	December 1, 1895.....	4,696
December 1, 1899.....	3,078	December 31, 1896.....	4,373
December 1, 1900.....	3,919	December 31, 1897.....	4,485

TABLE NO. 16.

ING THE DIFFERENT KINDS AND SIZES OF METERS BELONG-
TO THE CITY AND PRIVATE PARTIES IN SERVICE AND ON
ND DEC. 31, 1897.

KIND OF METERS.	Size in Inches.	PROPERTY OF CITY.			PRIVATE PROPERTY.			Grand Total of Meters in Service.	Grand Total of Meters in Shop.	Grand Total of all Meters.
		In Service.	At Work Shop.	Total.	In Service.	At Work Shop.	Total.			
ngton Improved.....	4	.....	.....	.....	2	.....	2	2	.....	2
ngton Improved.....	3	.....	.....	.....	4	.....	4	4	.....	4
ngton Improved.....	2	.....	.....	2	5	.....	5	7	.....	7
ngton Improved.....	1½	38	.....	40	5	.....	5	43	.....	45
ngton Improved.....	1	31	1	32	2	.....	2	33	1	34
ngton Improved.....	¾	117	2	119	2	.....	2	119	2	121
ngton Improved.....	⅝	94	1	95	20	.....	20	114	1	115
ngton old style.....	3	.....	3	3	.....	.....	.....	.....	3	3
ngton old style.....	2	2	.....	2	.....	.....	.....	2	.....	2
ngton old style.....	1½	8	1	9	.....	.....	.....	8	1	9
ngton old style.....	1	8	2	10	1	.....	1	9	2	11
ngton old style.....	¾	15	.....	15	.....	.....	.....	15	.....	15
ngton old style.....	⅝	6	.....	6	.....	.....	.....	6	.....	6
rotary.....	4	3	.....	3	.....	.....	.....	3	.....	3
rotary.....	3	2	.....	2	.....	.....	.....	2	.....	2
rotary.....	2	2	.....	2	.....	.....	.....	2	.....	2
rotary.....	1½	6	.....	6	1	.....	1	7	.....	7
rotary.....	1	13	.....	13	.....	.....	.....	13	.....	13
rotary.....	¾	21	2	23	.....	.....	.....	21	2	23
rotary.....	⅝	82	.....	82	.....	.....	.....	82	.....	82
piston.....	1	1	.....	1	.....	.....	.....	1	.....	1
piston.....	¾	1	.....	1	.....	.....	.....	1	.....	1
ra.....	⅝	6	.....	6	.....	.....	.....	6	.....	6
.....	1	.....	.....	.....	1	.....	1	1	.....	1
.....	¾	2	1	3	.....	.....	.....	2	1	3
.....	⅝	10	.....	10	1	.....	1	11	.....	11
"A".....	⅝	16	.....	16	.....	.....	.....	16	.....	16
"AA".....	⅝	60	.....	60	.....	.....	.....	60	.....	60
.....	4	2	.....	2	.....	.....	.....	2	.....	2
.....	3	1	.....	1	.....	.....	.....	1	.....	1
.....	2	9	.....	9	1	.....	1	10	.....	10
.....	1½	34	.....	34	.....	.....	.....	34	.....	34
.....	1	28	2	28	.....	.....	.....	28	2	28
.....	¾	18	.....	18	.....	.....	.....	18	.....	18
.....	⅝	72	.....	72	2	.....	2	74	.....	74
.....	⅝	.....	1	1	.....	.....	.....	.....	1	1
"AA".....	1½	4	.....	4	.....	.....	.....	4	.....	4
"AA".....	1	17	.....	17	.....	.....	.....	17	.....	17
"AA".....	⅝	553	3	556	.....	.....	.....	553	3	556
.....	4	1	.....	1	.....	.....	.....	1	.....	1
.....	2	8	1	9	.....	.....	.....	8	1	9
.....	1	35	1	36	.....	.....	.....	35	1	36
.....	¾	45	1	46	.....	.....	.....	45	1	46
.....	⅝	20	.....	20	.....	.....	.....	20	.....	20
.....	1½	14	.....	14	.....	.....	.....	14	.....	14
"A".....	1	2	.....	2	.....	.....	.....	2	.....	2
"A".....	¾	4	1	5	.....	.....	.....	4	1	5
"A".....	⅝	5	.....	5	.....	.....	.....	5	.....	5
"AA".....	⅝	.....	1	1	.....	.....	.....	.....	1	1
.....	4	.....	.....	.....	1	.....	1	1	.....	1
on.....	3	1	.....	1	.....	1	1	1	1	2
on.....	1	2	.....	2	.....	.....	.....	2	.....	2
on.....	¾	6	2	8	.....	.....	.....	6	2	8
on "B".....	⅝	18	.....	18	.....	.....	.....	18	.....	18
on "B".....	2	1	.....	1	1	.....	1	2	.....	2
on "B".....	1½	2	.....	2	.....	.....	.....	2	.....	2
on "B".....	1	4	1	5	.....	.....	.....	4	1	5
on "B".....	¾	12	.....	12	.....	.....	.....	12	.....	12
on "B".....	⅝	49	1	50	.....	.....	.....	49	1	50
on "B".....	1½	1	.....	1	.....	.....	.....	1	.....	1
rt.....	2	2	2	4	.....	.....	.....	2	2	4
rt "A".....	¾	12	.....	12	.....	.....	.....	12	.....	12
rt "A".....	⅝	1	.....	1	.....	.....	.....	1	.....	1

TABLE NO. 16—Continued.

Hersey	3
Hersey	2
Hersey ..	1½
Hersey	1
Hersey ..	¾
Hersey ..	¾
Hersey disc.....	2
Hersey disc.....	1½
Hersey disc.....	¾
Frost	¾
Sport	¾
Trident	1
Trident	¾
Trident	¾
Westinghouse	2
Westinghouse	1½
Westinghouse ..	1
Westinghouse ..	¾
Pittsburg disc	2
Pittsburg disc ..	1½
Pittsburg disc ..	1
Pittsburg disc.....	¾
Pittsburg disc ..	¾
Totals	

PUMPING STATIONS AND RESERVOIR—Continued.

VADNAIS LAKE STATION.

Year.	Salaries.	Fuel.	Machine Oil and Waste.	Repairs and Supplies.	Kerosene Oil.	Total.	WATER PUMPED.		FUEL, COAL, ETC.	
							Annually.	Daily.	Annually.	Daily.
1891	\$1,100.00	\$1,081.68	\$50.75	\$197.12	\$6.36	\$2,435.91	207,750,000	.....	246,800	.....
1892	1,020.00	1,005.25	73.71	102.19	25.90	3,127.05	.....	.....	.....	.....
1893	600.00	.....	.....	21.35	.....	621.35	.....	.....	.....	.....
1894	912.50	1,508.99	21.06	216.75	20.60	2,679.90	337,160,000	.....	624,387	.....
1895	848.33	1,105.00	47.50	31.58	11.64	2,044.05	237,043,000	.....	550,000	.....
1896	1,147.48	1,618.77	44.22	38.76	32.52	2,881.75	938,611,850	2,364,262	612,614	.....
1897	754.00	479.83	6.59	46.92	9.81	1,297.15	290,298,356	795,341	186,950	.....

WEST ST. PAUL STATION.

1893	\$1,237.75	\$589.63	\$29.72	\$23.50	\$15.10	\$1,895.70	10,015,722	27,440	208,043	571
1894	1,320.00	328.96	2.88	28.83	14.20	1,694.87	9,123,480	24,890	169,220	463
1895	1,320.00	209.50	5.27	26.47	9.08	1,600.32	10,520,640	28,848	174,600	479
1896 (13 mos.)	1,430.00	529.88	4.58	33.37	12.00	2,009.83	13,497,120	33,998	212,200	535
1897	1,320.00	361.22	5.36	42.86	11.60	1,741.04	16,018,200	43,886	229,800	629

CENTERVILLE STATION.

1897	\$843.50	\$1,704.85	\$35.92	\$2.54	\$9.54	\$2,656.39
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RESERVOIR.

Year.	Salaries.	Year.	Salaries.
1891	1895
1892	1896 (13 months)
1893	1897
1894	.....		.....
	\$405.00		\$405.00
	405.00		430.00
	405.00		405.00
	405.00		405.00

TABLE NO. 18.
COMPARATIVE STATEMENT OF HOSE VIOLATIONS FOR 1894-5-6 AND 7.

VIOLATIONS.	1894.			1895.			1896.			1897.		
	High.	Low.	Total.	High.	Low.	Total.	High.	Low.	Total.	High.	Low.	Total.
Hose, 1 violation.....	200	129	329	138	87	223	155	46	201	91	9	100
Hose, 2 violations.....	28	16	44	5	1	6	10	3	13	1	.....	1
Hose, 3 violations.....	13	7	20	1	.....	1	1	1	2	2	.....	2
Hose, 4 violations.....	2	3	5	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hose, 5 violations.....	1	2	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hose, 7 violations.....	2	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reel, 6 to 9 p. m., 1 violation.....	185	50	235	34	.....	34	61	4	65	37	1	38
Reel, 6 to 9 p. m., 2 violations.....	22	14	36	6	.....	6	1	.....	1	2	.....	2
Reel, 6 to 9 p. m., 3 violations.....	6	2	8	2	.....	2	1	.....	1	.....	.....	.....
Reel, 6 to 9 p. m., 4 violations.....	2	1	3	2	.....	2	.....	.....	.....	.....	.....	.....
Reel, 6 to 9 p. m., 7 violations.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hose, all day, 1 violation.....	162	34	196	1	.....	1	40	3	43	26	9	35
Hose, all day, 2 violations.....	23	9	32	1	.....	1	.....	.....	.....	3	.....	3
Hose, all day, 3 violations.....	2	4	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hose, all day, 4 violations.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	648	274	922	188	88	276	269	57	326	163	19	182

TABLE NO. 19.

STATEMENT SHOWING THE NUMBER OF MILES OF PIPE LAID ANNUALLY TO DATE, EXPENSE OF SAME, FRONTAGE TAX, ETC.

Mains Laid.	Expenditure on Account of Laying Mains.	Construction Outside of City.	Annual Maintenance	Number of Applications	Annual Receipts from Consumers.	Increase.	Frontage Tax Receipts.	Number of Fire Hydrants in Use.	Frontage Tax Assessment.	Years Frontage Tax Has Been Paid Since 1884.	Years More to Pay on Basis of 10 Years.
To Aug. 10,				2,007							
From Aug.	a \$12,800.44	\$1,504.80	\$1,674.56	118							
From Dec.	61,003.97	100,021.10	6,854.30	301							
From Dec.	167,189.31	608,686.93	11,473.84	340							
From Dec.	207,586.90	40,148.36	b 19,275.58	1,003			\$12,283.04				
From Dec.	138,694.54	10,657.46	17,976.64	1,004			19,538.20				
From Dec.	225,443.70	82,975.47	22,808.59	1,072	\$100,035.23	\$12,170.71	32,455.01				
From Dec.	248,016.19	97,736.81	23,700.81	1,214	112,720.01	6,064.14	43,082.90				
From Dec.	257,680.58	80,600.60	26,122.60	1,814	124,920.80	12,200.80	55,088.01				
From Dec.	211,018.64	28,026.20	c 30,082.75	1,407	138,913.61	13,002.71	73,079.70				
From Dec.	46,029.69	38,637.07	36,473.82	1,075	159,561.20	20,648.48	68,987.80				
From Dec.	e 119,243.20	41,327.25	35,349.12	881	171,164.09	11,903.40	112,062.57				
From Dec.	63,325.15	4,590.46	36,404.84	625	177,685.21	6,430.62	107,898.11				
From Dec.	42,287.17	6,108.62	d 30,130.72	502	178,967.82	1,372.11	112,115.05				
From Dec.	f 81,800.69	24,624.65	38,006.14	701	179,246.82	279.20	137,171.40				
From Dec.	h 64,925.03	116,564.23	g 41,940.24	540	190,714.78	11,468.20	123,172.49				
From Dec.	23,305.72	27,885.79	57,105.41	430	170,796.85	1 19,918.43	100,446.51				
	\$2,016,507.81	\$1,268,635.57	\$433,345.00	15,212			\$1,048,389.14				
Less relaid in							\$2,688.04				
Net amount							\$1,040,701.10				

Lafayette avenue near Trout Brook, of regrading street, at an expense of \$4,077.97.

service in fall of 1884.

plant at Vadnais lake, also Rice lakes.

service in West St. Paul in fall of 1892.

main to reservoir.

h supply main on Dale street from reservoir to Dale and Front, at an expense of \$38,305.78

-inch cast iron force main from McCarron lake pumping station to high service reservoir, at an expense

LIST OF VOUCHERS PAID FROM JAN. 1, 1897, TO DEC. 31, 1897.
JANUARY, 1897.

No. of Voucher.	NAME.	Amount.
8480	C. L. Horst, city treasurer.....	\$3,701.42
8481	C. L. Horst, city treasurer.....	5,850.00
8482	C. L. Horst, city treasurer.....	3,750.00
	.....	2.18
	.....	25.40
	.....	3.89
	.....	2.50
	.....	3.68
	Benedict.....	4.10
	.....	16.50
	.....	24.89
	.....	40.04
	& Co.....	12.89
	.....	.75
	Ex. Co.....	7.25
	.....	4.50
	.....	2.08
	.....	6.00
	.....	6.50
	Mnfg. Co.....	2.25
	.....	5.00
	.....	3.75
	.....	33.10
	.....	261.26
	.....	75.00
	.....	2.00
	ing Co.....	2.75
	.....	15.00
	Co.....	6.05
	.....	9.67
	Co.....	7.44
	.....	10.05
	.....	55.80
	.....	1.50
	.....	.38
	.....	8.88
	.....	21.84
	.....	73.59
	.....	24.84
	.....	4.43
	.....	11.25
	.....	11.25
	.....	13.10
	ch. Co.....	52.50
	.....	19.89
	.....	55.25
	.....	3.00
	.....	245.00
	.....	\$14,400.02

LIST OF VOUCHERS—Continued.

MARCH, 1897.

No. of Voucher.	NAME.	CLAIM.	Amount.
8573	C. L. Horst, city treasurer.....	Pay roll for February.....	\$3,227.00
8574	C. L. Horst, city treasurer.....	Interest due April 1, 1897.....	25,000.00
8575	D. L. Bell.....	Cement and cement bags.....	8.05
8576	Jno. Martin Lumber Co.....	Lumber	8.00
8577	Union Water Meter Co.....	Meter fixtures	14.25
8578	Thomson Meter Co.....	Meter fittings	12.30
8579	D. Cardinal	Oats	15.76
8580	Dispatch Printing Co.....	Advertising	3.00
8581	The Washburn Building.....	Electric lighting—Office	30.00
8582	Goodyear Rubber Co.....	Hose, etc.....	85.51
8583	South Pk. Foun. & Mach. Co....	Repacking hydrant valves, etc.	31.20
8584	Frank Hart, clerk of court, Anoka, Minn.....	Transcripts, Belland et al. vs. Water Board	67.50
8585	H. W. Phillips, Asst. Corp. Atty..	Deposit clerk of court Hennepin Co., water board.....	55.00
8586	Jos. Trudeau	Tools	1.30
8587	A. Lamotte	Tamarack timber for intake pipe	20.00
8588	Joseph Carkey	Rent of portable engine, intake	6.80
8589	Dearborn Drug & Chemical Wks.	Cylinder oil	22.50
8590	V. R. Benham.....	Engine and cylinder oil.....	6.05
8591	Thos. Brennan Lumber Co.....	Lumber	43.66
8592	J. G. Duggan.....	Sharpening tools	4.00
8593	H. C. Boyeson Sta. Co.....	Stationery	6.70
8594	Wyckoff, Seamans & Benedict....	Letter book, etc.....	4.05
8595	Brown, Treacy & Co.....	Stationery	10.00
8596	Foley Bros. & Kelly Merc. Co....	Oil, candles, etc.....	8.88
8597	Farwell, Ozmun, Kirk & Co.....	Tools	6.00
8598	The Crane & Ordway Co.....	Engine fittings	2.58
8599	Estate of Jas. Gillilan.....	Rent of storage lot.....	25.00
8600	Robinson & Cary Co.....	Vacuum Gauges	30.10
8601	T. L. Blood & Co.....	Asphalt paint, etc.....	3.05
8602	H. E. Wedelstaedt & Co.....	Stationery	8.10
8603	Jno. Rogers, Jr. & Bro.....	Insurance on wood.....	12.00
8604	C. Neumann.....	Meals for officers to Centerville	20.00
8605	M. Mealey	Cloth for asbestos covering boilers, etc.....	1.08
8606	N. W. Fuel Co.....	Est. No. 5, fuel.....	91.63
8607	Geo. J. Mitsch & Co.....	Supplies	7.45
8608	H. M. Smyth Printing Co.....	Job printing	7.25
8609	American Hoist & Derrick Co....	Rubber diaphragm for pump...	4.00
8610	Mitsch Wagon & Carriage Co....	Repairing cutter	3.25
8611	P. N. Lindquist	Horse shoeing	1.50
8612	Boeringer & Son.....	Repairing engineer's rods, etc.	6.50
8613	D. L. Bell.....	Cement	2.80
8614	Jno. Martin Lumber Co.....	Lumber	8.00
8615	J. H. Schurmeler Wag. & Car. Co.	Repainting and repairing bug-gies, etc.....	50.75
8616	Wedelstaedt & Carmen.....	Job printing	5.75
8617	Dan Cashill & Co.....	Horseshoeing	3.00
8618	Cornplanter Oil Co.....	Gasoline .....	.60
8619	A. & W. McGuiggan.....	Screen frames	6.50
8620	Nels Proulx	Wood for Centerville station..	50.00
8621	Leon F. Dupre.....	Wood for Centerville station..	50.00
8622	Aug. Thon.....	Wood for Centerville station..	38.75
8623	Henry Dupre	Wood for Centerville station..	37.50
8624	A. Totte.....	Wood for Centerville station..	30.00
8625	Mich. Gallagher	Wood for Centerville station..	28.75
8626	Severe R. Dufresne	Wood for Centerville station..	62.50
8627	Jno. E. Barrott.....	Wood for Centerville station..	62.50
8628	Jos. Proulx, Sr.....	Wood for Centerville station..	34.00
8629	Phillip F. Lamotte.....	Wood for Centerville station..	62.50
8630	Joseph Krinsner, Jr.....	Wood for Centerville station..	37.50
8631	Andrew Anderson	Wood for Centerville station..	30.00

LIST OF VOUCHERS.—Continued.

MARCH 1897—Continued.

NAME.	CLAIM.	Amount.
Jos. Trudeau	Wood for Centerville station..	55.00
Geo. Boehm	Wood for Centerville station..	30.00
Alfred Gagner	Wood for Centerville station..	32.00
Napoleon Savigney	Wood for Centerville station..	41.00
Michael Zelbel	Wood for Centerville station..	37.50
John B. Proulx	Wood for Centerville station..	30.00
Leon Dupre	Wood for Centerville station..	58.00
Joseph Garceau	Blacksmithing	2.50
Joseph Carpenter	Nails	2.50
J. A. Leyde	Rent of portable engine.....	46.50
J. Cardinal	Rubble rock	28.00
Joseph N. Forcier.....	Board and teaming.....	26.80
Geo. C. Garrow, agent.....	Tires for vault book case.....	2.00
Geo. Caulfield, secretary.....	Cash advanced	50.48
W. H. Ulmer.....	Stone flagging	5.50
Ransome Subway Co.....	Est. No. 6, Otter Lake conduit.	413.29
J. L. Horst, city treasurer.....	Investment in sinking fund....	15,000.00
N. W. Telephone Ex. Co.....	Repairing country line	4.50
Neptune Meter Co.....	Meters	210.00
National Meter Co.....	Meters	475.00
Lyle M. Fisher.....	Est. No. 1 and final, printing annual report	335.80
Total		\$46,419.73

LIST OF VOUCHERS—Continued.

APRIL, 1897.

No. of Voucher.	NAME.	CLAIM.	Amount.
8653	C. L. Horst, city treasurer.....	Pay roll for March.....	\$3,012.17
8654	Union Brass & Metal Mnfg. Co..	Float and valve, etc.....	3.85
8655	Joseph F. Lamotte.....	Hauling coal from Hugo stati'n	24.40
8656	Foley Bros. & Kelly Merc. Co....	Oil and candles.....	21.91
8657	T. L. Blood & Co.....	Oil and red lead.....	1.50
8658	Dan Cashill & Co.....	Horseshoeing	6.00
8659	Brown, Treacy & Co.....	Stationery	32.55
8660	Volkszeitung Publishing Co.....	Advertising	2.50
8661	Pioneer Press Co.....	Blank books and advertising..	15.22
8662	Jos. N. Forcier.....	Board and teaming.....	14.00
8663	J. G. Duggan.....	Sharpening tools	8.25
8664	Cornplanter Oil Co.....	Gasoline	1.20
8665	Dispatch Printing Co.....	Advertising	7.50
8666	Wyckoff, Seamans & Benedict....	Ribbon for typewriter.....	1.00
8667	Robinson & Cary Co.....	Wire cloth, packing, tools, etc.	33.05
8668	The Crane & Ordway Co.....	Pipe and pipe fittings.....	24.97
8669	H. E. Wedelstaedt.....	Stationery	2.80
8670	H. C. Boyeson Stationery Co.....	Stationery	1.50
8671	N. W. Fuel Co.....	Estimate No. 6, fuel.....	236.50
8672	Pioneer Fuel Co.....	Estimate No. 4, coal.....	37.50
8673	Roeringer & Son.....	Drawing ink .....	.50
8674	Dennis Bernier.....	Wood	56.12
8675	Jno. F. Hall.....	Wood	34.25
8676	Joseph Arth	Wood	50.62
8677	Napoleon Morrisette.....	Wood	50.00
8678	Charlotte Rogers	Wood	34.75
8679	Bert Hughes	Wood	37.00
8680	Sam'l L. Neal.....	Wood	23.12
8681	Jos. N. Forcier.....	Wood	63.75
8682	Walter P. Jones.....	Wood	2.50
8683	Ambrose Brisette.....	Wood	7.81
8684	John Leibell.....	Wood	5.00
8685	J. H. Schurmier Wagon & Car. Co	Oil carpet for buggy.....	1.00
8686	Kenny Bros.....	Repairing boiler.....	5.50
8687	Farwell, Ozmun, Kirk & Co.....	Nails, etc.....	37.00
8688	The Globe Co.....	Advertising	3.00
8689	Mitsch Wagon & Carriage Co....	Painting and repairing buggies	32.55
8690	Jno. Martin Lumber Co.....	Lumber	20.17
8691	Estate of Jas. Gilfillan.....	Rent of storage lot.....	25.00
8692	Frank Skok.....	Steel pointing picks.....	5.40
8693	N. W. Copper & Brass Works....	Repairing water gauge.....	.50
8694	O. J. Piette.....	Weighing coal	1.90
8695	John A. Lavallee.....	Board of Shouse.....	3.50
8696	The Crane & Ordway Co.....	Estimate No. 1 and final, lead pipe and block tin.....	1,573.61
8697	John Caulfield, secretary.....	Cash advanced	94.02
8698	C. L. Horst, city treasurer.....	Interest due May 1, 1897.....	8,750.00
8699	The E. P. Allis Co.....	Suction pipe, 36-inch.....	63.45
8700	Union Brass & Metal Mnfg. Co..	Valves	8.00
8701	The E. P. Allis Co.....	Estimate No. 2, pump engine..	5,000.00
	Total		\$19,505.90

LIST OF VOUCHERS—Continued.

MAY, 1897—Continued.

No. of Voucher.	NAME.	CLAIM.	Amount.
8763	A. & W. McGuiggan.....	Moving storm sash.....	1.80
8764	Mitsch Wagon & Carriage Co....	Blacksmithing	8.55
8765	Bingham & Taylor.....	Estimate No. 1, valve boxes..	227.45
8766	Anthony P. Smith.....	Estimate No. 4, patent sleeves and valves	92.00
8767	Joseph Arth.....	Wood	21.71
8768	Aug. Rehbein	Wood	20.62
8769	Warren-Scharf Asphalt Pav. Co..	Repairing pavement	17.29
8770	The Engineering Record.....	One year's subscription	5.00
8771	Jos. A. Forcier.....	Board for surveyors	7.41
8772	Allen & Co.....	Livery	5.00
8773	National Meter Co.....	Meter fixtures	15.00
8774	The Dwyer Plumbing & Heat. Co.	Estimate No. 1, service boxes..	925.00
8775	Napoleon Savigney.....	Tamarack piling	45.50
8776	South Park Foundry & Mach. Co.	Valves and special castings....	58.00
8777	C. L. Horst, city treasurer.....	Interest on bonds due June 1, 1897	7,000.00
	Total		\$18,874.71

LIST OF VOUCHERS—Continued.

JUNE 1897—Continued.

No. of Voucher.	NAME.	CLAIM.	Amount.
8838	C. A. Fuller.....	Estimate No. 1 and final, plg lead.....	518.93
8839	The Crane & Ordway Co.....	Estimate No. 2, brass gcods...	250.53
8840	Jno. Caulfield, secretary.....	Cash advanced	174.89
8841	J. W. Cunningham & Co.....	Job printing	14.75
8842	Foley Bros. & Kelly Mer. Co....	Candles	4.80
8843	Cornplanter Oil Co.....	Oil and gasoline.....	32.71
8844	T. L. Blood & Co.....	Paint	1.70
8845	P. H. Thornton.....	Estimate No. 1, laying mains..	321.73
8846	C. L. Horst, city treas.....	Sinking fund investment.....	50,000.00
	Total		\$63,556.95

LIST OF VOUCHERS—Continued.

SEPTEMBER, 1907.

No. of Voucher.	NAME.	CLAIM.	Amount.
8068	Thos. Rashak.....	Blasting timbers	8.75
8070	South Park Foundry & Mach. Co.	Estimate No. 1, sprinkler at- 2274	388.00
8071	T. Vandiac.....	14, hauling coal	27.85
8072	Olzenski & Romans.....	Meals pumps, Center- ville	53.50
8073	St. Paul Furniture Co.....	Re stool	1.00
8074	St. Paul Lime & Cement Co.....	.....	9.12
8075	N. W. Telephone Exchange Co.	Re private line...	25.00
8076	N. W. Shot & Lead Works	Lead pipe	10.35
8077	John Kenny.....	Weir r Vadnais lake...	45.75
8078	National Meter Co .....	.....	6.00
8079	Pittsburg Meter Co.....	.....	568.00
8080	The E. P. Allis Co.....	3, pump, Center-	5,000.00
8081	F. W. Luley & Son.....	.....	1.60
8082	Thos. Brennan Lumber Co.....	is Lake engine	41.60
8083	South Park Foundry & Mach. Co	imate No. 1, fire hydrants..	130.00
8084	South Park Foundry & Mach. Co	imate No. 4, valves	125.75
8085	South Pittsburg Pipe Works	2, pipe.....	3,404.83
8086	H. A. Muckle Mfg. Co.....	.....	76.00
8087	Scarbner-Libby Co	etc	35.56
8088	James Shiely	Cardigan June-	9.75
8089	James Shiely	drayage.....	172.50
8090	C. L. Horst, city treasurer	roll for August.....	4,058.31
8091	C. L. Horst, city treasurer.....	rest due Oct. 1, 1907.....	25,000.00
8092	South Pittsburg Pipe Works	Est. No. 3, 1527-224	856.81
8093	.....	April 25, 1908..	3.00
8094	.....	.....	35.37
8095	st. ....	.....	5.50
8096	& Co.....	.....	15.50
8097	.....	four horses to	8.00
8098	Washburn building .....	.....	5.00
	.....	.....	3.50
	Co.....	.....	18.00
	.....	.....	5.83
	.....	.....	6.10
	.....	.....	2.00
	.....	.....	6.50
	.....	lot.....	25.00
	.....	.....	7.00
	.....	rial	4.25
	.....	.....	.06
	.....	bling	30.44
	ach. Co.	ice gate.....	175.00
	ach. Co.	hydrants	472.50
	.....	.....	2.75
	.....	.....	1.78
	.....	.....	7.08
	.....	.....	.75
	.....	.....	5.82
	Co.....	.....	27.78
	Co.....	.....	5.95
	.....	.....	.51
	.....	.....	8.83
	educt...	pples	1.50
	.....	.....	18.66
	.....	.....	8.80
	.....	el.....	75.77
	.....	ings, etc.....	28.07
	.....	e	60.36

LIST OF VOUCHERS—Continued.

SEPTEMBER, 1897—Continued.

No. of Voucher.	NAME.	CLAIM.	Amount.
9027	Mitsch Wagon & Car. Co.....	Blacksmithing	2.28
9028	D. L. Bell.....	Cement	43.45
9029	Geo. J. Mitsch & Co.....	Supplies	13.55
9030	Robinson & Cary Co.....	Valves, waste, etc.....	75.17
9031	Henry Orme	Est. No. 3, special castings....	291.16
9032	American Hoist & Derrick Co....	Two 12-inch iron blocks.....	6.50
9033	Jno. Martin Lumber Co.....	Lumber and posts	47.73
9034	Jno. Caulfield, secretary.....	Cash advanced	94.05
9035	C. Neumann	Meals, account right of way suit	18.90
9036	South Park Foun. & Mach. Co...	Est. No. 5, valves.....	60.50
9037	S. C. Smith.....	Team to Centerville.....	15.50
9038	Pittsburg Meter Co.....	Est. No. 3, meters.....	400.00
9039	Fairbanks, Morse & Co.....	Est. No. 2, laying water pipe, etc.....	1,253.99
	Total		\$43,367.78

LIST OF VOUCHERS—Continued.

OCTOBER, 1897.

No. of Voucher.	NAME.	CLAIM.	Amount.
9040	C. L. Horst, city treasurer.....	Interest on bonds due Nov. 1, 1897	\$8,750.00
9041	South Park Foun. & Mach. Co..	Est. No. 6, valves	476.00
9042	South Park Foun. & Mach. Co..	Est. No. 3, fire hydrants.....	155.00
9043	Pioneer Press Co.....	Job printing	60.75
9044	St. Paul Lime & Cement Co.....	Drain tile	12.00
9045	Thos. Brennan Lumber Co.....	Lumber	58.87
9046	Boeringer & Son.....	Repair Eng. instruments.....	5.05
9047	St. Paul & Duluth R. R. Co.....	Freight on Venturi meter.....	51.50
9048	Chas. Friend & Son.....	Saddlery, hardware, etc.....	1.25
9049	Bohn Mfg. Co.....	Two slat doors.....	4.00
9050	Griggs Bros.	Hay	21.28
9051	E. A. Brown.....	Nickel timer to test wells.....	7.50
9052	A. W. McGuiggan.....	Map trays, etc.....	3.65
9053	John A. Lavallo	Board foreman	3.75
9054	Fielding & Shepley.....	Repairing pavement	85.55
9055	E. Sawyer, treas. G. N. R. R. Co.	Labor, Rice street main.....	6.04
9056	Pittsburg Meter Co.....	Est. No. 4, meters.....	400.00
9057	South Park Foundry.....	Hydrant tops, etc.....	36.44
9058	C. L. Horst, city treasurer.....	Pay roll for September.....	4,188.09
9059	A. Decker & Co.....	Nails and tools	5.16
9060	Washburn Building	Electric light	5.00
9061	Dan Cashill & Co.....	Horse shoeing	4.00
9062	D. L. Bell.....	Cement	354.70
9063	J. G. Duggan.....	Blacksmithing	6.05
9064	Chas. Friend & Son.....	Harness fittings	4.40
9065	P. N. Lindquist.....	Horse shoeing	4.00
9066	Farwell, Ozmun, Kirk & Co.....	Hardware .....	.25
9067	M. F. Brennan.....	Livery	2.00
9068	Nimis & Meyer.....	Wire, etc.....	5.40
9069	Diebold Safe & Lock Co.....	Changing combination safe....	1.00
9070	Scheffer & Rossum.....	Leather for dash pots.....	1.20
9071	Cornplanter Oil Co.....	Gasoline	1.20
9072	T. L. Blood & Co.....	Oil, brush, etc.....	1.88
9073	The Western Supply Co.....	Pig tin, pipe, etc.....	44.54
9074	Brown, Treacy & Co.....	Stationery	9.23
9075	St. Paul Furniture Co.....	Stationery cabinet, etc., office..	33.50
9076	Wyckoff, Seamans & Benedict...	Typewriter supplies	9.35
9077	H. C. Boyeson Sta. Co.....	Stationery	8.00
9078	H. E. Wedelstaedt & Co.....	Stationery	4.78
9079	Boeringer & Co.....	Drawing material	1.25
9080	Foley Bros. & Kelly Merc. Co....	Oil, soap and lye.....	27.99
9081	N. W. Fuel Co.....	Est. No. 12 and final, fuel, 1896	382.88
9082	Henry Orme	Est. No. 4, special castings....	22.29
9083	South Park Foundry & Mach. Co.	Est. No. 7, valves.....	30.25
9084	South Park Foundry & Mach. Co.	Est. No. 4, fire hydrants.....	31.00
9085	South Park Foundry & Mach. Co.	Machine work	10.54
9086	Crane & Ordway Co.....	Pipe fittings	11.51
9087	Robinson & Cary Co.....	Pipe fittings	38.58
9088	Est. of Jas. Gillfillan.....	Rent of storage lot.....	25.00
9089	Jno. Martin Lumber Co.....	Lumber for meter boxes, etc..	62.56
9090	Pittsburg Meter Co.....	Meters	400.00
9091	C. W. Peterson.....	Taking care of boat, Lake Phalen	2.00
9092	The Dwyer Heat. & Plumb. Co..	Est. No. 2, service boxes.....	18.50
9093	Bingham & Taylor.....	Est. No. 2, valve boxes.....	378.24
9094	Jas. Shiely	Est. No. 2, drayage.....	15.61
9095	Jas. Shiely	Hauling pumps, Baldwin Lake to St. Paul.....	5.00
9096	E. A. Leyde.....	Rent of engine.....	21.75
9097	Union Brass & Metal Mfg. Co..	Brass work	4.00
9098	Peter Johnson	Gravel for reservoir weir.....	78.75
9099	E. W. Bazille abstract clerk....	Abstracts	4.90
9100	Jos. N. Forcier.....	Board, account right of way...	14.30
9101	S. C. Smith.....	Livery to Centerville.....	3.50
9102	Pioneer Press Co.....	Covers for meter bills.....	11.50
9103	The Samuel Carmen Printing Co.	Printing postal cards.....	2.00

ANNUAL REPORT OF WATER COMMISSIONERS

LIST OF VOUCHERS—Continued.

NOVEMBER, 1897.

[illegible]

LIST OF VOUCHERS—Continued.

DECEMBER, 1897—Continued.

No. of Voucher.	NAME.	CLAIM.	Amount.
9252	E. G. Smith.....	Analysis of water.....	\$88.50
9253	Pioneer Press Co.....	Blank books.....	28.75
9254	St. Paul Fire & Marine Ins. Co..	Insurance—Office building....	20.30
9255	Chas. Friend & Son.....	Fur robe.....	11.00
9256	W. H. Brögger.....	Cleaning flues.....	4.00
9257	H. W. Phillips, Asst. Corp. Atty.	Expenses in lawsuits.....	13.50
9258	Fielding & Shepley.....	Relaying pavement.....	174.41
9259	Pittsburgh Meter Co.....	Est. No. 6—Meters.....	460.00
9260	Martin Felst.....	Lunch for men cleaning conduit	3.50
9261	Dearborn Drug & Chem. Works..	Oil.....	21.60
9262	Jas. Caulfield, Secretary.....	Cash advanced.....	76.00
9263	Jno. Kenny.....	Est. No. 2 and final—Smoke stack.....	25.00
9264	Gronier & Co.....	Brick.....	53.84
9265	Scribner-Libby Co.....	Roof for storage shed.....	84.14
9266	R. B. C. Gement.....	Balance on salary.....	283.39
9267	John Caulfield.....	Balance on salary.....	708.39
9268	Fairbanks, Morse & Co.....	Est. No. 5 and final, laying pipe	275.12
	Total.....		\$8,765.50
	Grand total.....		\$200,381.51

Vadnais lake weir and artesian wells, high service reservoir weir, and the Venturi meter have been completed during the year, all of which work was done by day labor by this department, according to plans and specifications furnished by the city engineer, whose report to the board will show the cost of said work. Therefore I omit all detail matter in relation thereto.

SUMMARY OF RECOMMENDATIONS.

Gate-house at outlet of Lake Phalen.

Gate-house at outlet of Pleasant lake.

Blow-off on Vadnais lake conduit at Sandy lake.

Iron fence around high service reservoir.

Piling to protect well boxes from ice at Centerville.

Piling to support twelve-inch main at crossing of Rice street and Great Northern Railroad Company tracks.

Side track for unloading coal at McCarron lake station.

Place automatic valves on services supplying fountains with water.

In conclusion, I desire to express my thanks for the courtesy and assistance tendered me in the performance of my duty by your honorable board.

Respectfully submitted,

A. R. STARKEY,
Superintendent.

PIPE LAID ON WEST SIDE HIGH SERVICE DURING THE YEAR 1897

Date.	Street.	From Street to Street.	6 inch.
May 28....	Cherokee ave.	At intersection with Smith ave.....	108
Total 6-inch pipe.....			108 feet

PIPE RELAID ON LOW SERVICE DURING THE YEAR 1897.

Date.	Street.	From-To.	
Oct. 16	Broadway..	At intersection with Eighth, 24-inch replaced with.....	
Oct. 16	Broadway...	At intersection with Tenth, 6-inch cement pipe relaid with..	
Oct. 16	Broadway..	At intersection with Tenth, 24-inch replaced with.....	
Sept. 23	Lafayette ave	Grove—50 feet northerly, 16-inch cement pipe relaid with.....	
Oct. 5	Locust . . .	Seventh to Eighth, 16-inch cement pipe relaid with.....	
Oct. 5	Locust.....	Seventh to Eighth, 16-inch cement pipe relaid with....	
Oct. 5	Locust....	Ninth to Tenth, 16-inch cement pipe relaid with	
Oct. 5	Locust.....	Ninth to Tenth, 16-inch cement pipe relaid with.....	
April 26	Eighth	At intersection with Wacouta, 4-inch relaid with.....	84
Oct. 9	Eighth. . .	Minnesota to Locust, 4-inch relaid with	3,182
Oct. 9	Eighth.....	At intersection with Minnesota, 4-inch replaced with.....	
Oct. 9	Eighth . . .	At intersection with Locust, 4-inch replaced with.....	
Sept 25	Tenth.....	Pine to Locust, 6-inch relaid with	
Aug 28	Tenth . . .	Jackson to Broadway, 4-inch relaid with	
Aug. 21	Tenth . . .	At intersection with Pine, 6-inch replaced with.....	
Sept. 4	Minnesota ..	At intersection with Eighth, 4-inch replaced with.....	
Sept. 4	Robert.....	At intersection with Eighth, 6-inch replaced with.....	
Sept. 4	Jackson . . .	At intersection with Eighth, 12-inch replaced with.....	
Aug. 28	Temperance..	At intersection with Tenth, 4-inch replaced with.....	
Sept. 4	Temperance..	At intersection with Eighth, 4-inch replaced with....	
Aug. 28	Sibley.. . . .	At intersection with Tenth, 4-inch relaid with.....	8).....
Sept 11	Sibley.. . . .	At intersection with Eighth, 4-inch relaid with.....	4).....
Aug. 21	Canada.....	At intersection with Tenth, 6-inch cement pipe relaid with.	8).....
Aug. 21	Pine.....	At intersection with Tenth, 4-inch replaced with....	.).....

HYDRANTS PLACED IN 1896 AND 1897.

No.	LOCATION.	Service.	Double or Single Steamer.	Size of Pipe.	Pressure in ft.
2201	Wabasha, bet. Fifth and Sixth, w. side	Low.....	Double.....	6	3
2202	Sixth, bet. Wabasha and St. Peter, s. side	Low.....	Double.....	8	38
2203	Fifth and Market, 5, e. cor.....	Low.....	Double.....	6	33
2204	Cedar and Second, 22, w. cor.....	Low.....	Double.....	8	38
2205	W. Third, 65 ft. s. of Summit, e. side.	High.....	Single.....	6	59
2206	Oakland and Floral, n. w. cor.....	High.....	Single.....	4	58
2207	Summit, 325 ft. e. of Sixth, n. side...	High.....	Double.....	12	67
2208	Sixth and Summit, s. e. cor.....	High.....	Double.....	6	61
2209	Duke and Grace, n. w. cor.....	Low.....	Single.....	6	37
2210	Duke and St. Clair, s. w. cor.....	Low.....	Single.....	6	34
2211	Roble and Bellows, n. e. cor., West Side	High.....	Single.....	6	93
2212	Roble and Bidwell, n. w. cor., West Side	High.....	Single.....	6	25
2213	Louisa and Hall, s. w. cor., West Side	High.....	Single.....	6	86
2214	Sims and Cypress, n. e. cor.....	High.....	Single.....	6	54
2215	Arcade, 154.5 ft. s. of Wells, e. side..	High.....	Double.....	12	63
2216	Forest, 180 ft. s. of Wells, e. side....	High.....	Double.....	6	62
2217	Geranium and Bradley, n. e. cor.....	High.....	Single.....	6	43
2218	Geranium and Burr, n. e. cor.....	High.....	Single.....	6	53
2219	Westminster and Cayuga, n. w. cor..	High.....	Single.....	6	83
2220	Westminster and York, s. w. cor....	High.....	Single.....	6	77
2221	Agate and Case, n. w. cor.....	High.....	Single.....	6	86
2222	Bohn's factory, 215 ft. e. of Arcade, 357 ft. s. of Wells.....	Low.....	Double.....	16	10
2223	Bohn's factory, 208 ft. e. of Arcade, 380 ft. s. of Wells.....	Low.....	Double.....	16	10
2224	Bohn's factory, 50 ft. w. of Mendota, 320 ft. s. of Wells.....	Low.....	Double.....	16	10
2225	Marshall and Fry, n. w. cor.....	High.....	Single.....	12	34
2226	Marshall and Pierce, n. w. cor.....	High.....	Single.....	12	35
2227	Marshall and Aldin, n. w. cor.....	High.....	Single.....	12	38
2228	Marshall and Herschel, n. w. cor.....	High.....	Single.....	12	35
2229	Grand and Fairview, n. e. cor.....	High.....	Single.....	6	42
2230	Jessamine and Cypress, n. w. cor....	High.....	Single.....	6	38
2231	Lawson and Agate, n. w. cor.....	High.....	Single.....	6	80
2232	Onelda and Grace, s. w. cor.....	Low.....	Single.....	6	34
2233	Smith ave. and McBoal, s. w. cor....	Low.....	Single.....	6	37
2234	Cook and Agate, n. w. cor.....	High.....	Single.....	6	75
2235	Wells and Walsh, n. e. cor.....	High.....	Single.....	6	56
2236	Ellis and Sidney, n. e. cor.....	High.....	Single.....	6	40
2237	Lombard ave., 436 ft. w. of Milton...	High.....	Single.....	6	51
2238	Lombard ave. and Milton, n. w. cor..	High.....	Single.....	6	59
2239	James and Webster, n. w. cor.....	Low.....	Single.....	6	38
2240	Mackubin, 20 ft. n. of alley, bet. Portland and Summit aves.....	High.....	Single.....	6	34
2241	Asbury ave. and Blair, n. w. cor....	High.....	Single.....	6	41
2242	Conway and Earl, n. w. cor.....	High.....	Single.....	6	48
2243	Lawson and Bradley, n. w. cor.....	High.....	Single.....	6	68
2244	Cook, 300 ft. e. of Agate.....	High.....	Single.....	6	82
2245	Victoria and Hatch, s. w. cor.....	High.....	Single.....	12	35
2246	Vandalla and Charles, n. e. cor.....	High.....	Single.....	6	45
2247	Vandalla, 328 ft. n. of Charles.....	High.....	Single.....	6	44
2248	Goodrich ave., 167 ft. e. of Leech....	Low.....	Single.....	6	45
2249	Fuller and Lexington, n. w. cor.....	High.....	Single.....	6	51

New hydrants placed during the year 1897 on high service.....	14
New hydrants placed during the year 1897 on low service.....	3
Total for the year.....	17

DISTRICT.	Double Steamer.	Single Steamer.	Total Num of Hydrant Each Distr.
High service	11	1,375	1,
Low service	130	642	
West Side high service.....		91	
Total	141	2,108	2,

The number and location of the following hydrants are placed on private property. They are of the standard make and can be used in case of fire. Northwestern Cordage Works, 4; W. A. Wood Harvester Works, 11; North Pacific Shops, 3; Yoerg's Brewery, 1.

WATER MAINS ON HIGH SERVICE—Continued.

STREET.	FROM STREET TO STREET.	4-inch.	6-inch.	12-inch.	16-inch.	20-inch.	24-inch.	30-inch.	36-inch.
Wayzata.....	At Albemarle.....		90						
Wilder	Iglehart to St. Anthony.....		1388						
Whitall.....	Payne to Clark.....		2301						
Walker.....	Hewitt to Great Northern Ry.	807							
Wesley.....	Pascal to Fry.....	294	621						
Workhouse.....	Around workhouse.....		1043						
Wheeler St	Baylers to Everett.....								
Westminster.....	Cayuga to Case.....								
Wheeler Av.....	University to Shields.....		588						
Woodbridge.....	Atwater to Front.....		1297						
Winnipeg.....	Rice to Sylvan.....		1142						
Wells, N. S.	Edgerton to Arcade.....		2090						
Wells, south side.....	From E. to W. end of retaining wall.....	1130							
White Bear.	Seventh to Ames.....								
York.....	Forest to Corlland.....		5782						
Total.....		87749	549880.9	120874	87188	36224	15495	9234	8046
Total 4-inch pipe		37749							
Total 6-inch pipe.....			549880.9						
Total 12-inch pipe.....				120874					
Total 16-inch pipe.....					87188				
Total 20-inch pipe.....						36224			
Total 24-inch pipe.....							15495		
Total 30-inch pipe.....								9234	
Total 36-inch pipe.....									8046

Total 865690.9 feet, or 163.9377 miles.

3 2-inch brass Ls for air vents.
 5 spindles for 4-inch B. & M. gates.
 2 spindles for 6-inch B. & M. gates.
 11 spindles for 16-inch R. D. W.
 2 spindles for 20-inch R. D. W.
 1 spindle for 24-inch R. D. W. gate.
 1 spindle for 16-inch Galvin gate.
 8 spindles for 4-inch Ludlow gate.

4 spindles for 6-inch Ludlow gate.
 1 spindle for 12-inch Ludlow gate.
 1 spindle for 16-inch Ludlow gate.
 1 gate wrench 11½ feet long.
 5 gate wrenches 8 feet long.
 2 gate wrenches 6 feet long.
 2 always-ready wrenches, No. 2½ and No. 3.

HYDRANTS AND STANDPIPES.

9 D. S. hydrants, complete.
 13 S. S. hydrants, complete.
 1 D. S. hydrant without casing, reserve.
 2 S. S. hydrants, without casings, reserve.
 2 D. S. hydrant casings.
 1 S. S. hydrant casing.
 2 hydrant nozzle reducers.
 2 hydrant caps for gauges.
 18 hydrant brass top nuts.
 7 tops for D. S. hydrants.
 15 tops for S. S. hydrants.
 12 large caps for hydrants.
 12 small caps for hydrants.
 1 set standard samples for hydrants.
 2 6-inch plugs with 2-inch holes.
 42 4-inch plugs with 2-inch holes.
 48 rubber washers for D. S. hydrants.
 55 rubber washers for S. S. hydrants.
 16 6-inch bases for hydrants.
 9 4-inch bases for hydrants.
 5 D. S. hydrant rods.
 9 S. S. hydrant rods.
 10 S. S. hydrant rods, old.
 10 stuffing boxes for D. S. hydrants.
 25 stuffing boxes for S. S. hydrants.
 2 brass ring valves for D. S. hydrants.
 12 brass ring valves for S. S. hydrants.
 2 brass seats for D. S. hydrants.
 12 brass seats for S. S. hydrants.
 9 globe valves for D. S. hydrants.
 23 globe valves for S. S. hydrants.
 8 brass ring valve nuts (for fire hydrants).
 7 globe valve nuts (for fire hydrants).
 13 revolving nuts (for fire hydrants).
 7 5-inch extra brass nozzles.
 17 3-inch extra brass nozzles.

26 Holly hydrant rods.
 12 hydrant drip boxes
 10 sprinkling standpipe casings, complete.
 3 extra bases for standpipe casings.
 10 sprinkling attachment casings with box of bolts.
 12 stuffing boxes for sprinkling attachment.
 2 sprinkling standpipe casings.
 13 2-inch top valves for standpipes.
 12 2-inch top valves for standpipes, old.
 7 2-inch 45 deg. elbows.
 7 2-inch 90 deg. elbows, straight.
 5 2-inch 90 deg. elbows, plain.
 162 feet 2-inch galvanized pipe.
 300 feet ¾-inch to 2½-inch galvanized pipe, old.
 54 pieces 5 feet long 2½-inch hose for standpipes.
 17 hydrant wrenches.
 1 spanner.
 5 socket wrenches for repairs.
 2 seat wrenches for repairs.
 3 Coe's wrenches.
 3 S. wrenches.
 2 wrenches for standpipes.
 1 pair connectors.
 1 pair plyers.
 1 ½-inch suction drip pump.
 1 No. 5 chain tong.
 2 sets of light tackle blocks with ¾-inch rope.
 2 ratchets.
 1 stock and dies from ⅜ to 1 inch.
 2 chains 6 feet long.
 2 boilers for steaming out frozen hydrants.
 3 pieces ¾-inch hose for steaming, 16 feet long.
 22 caps for standpipe casings.

PIPE-LAYING TOOLS.

1 tool box.
 23 picks without handles.
 6 sledge hammers.
 1 striking hammer.
 4 mauls, complete.
 6 mauls without rings and handles.
 24 sledge handles.
 1 4-legged derrick.
 2 3-legged derricks.
 3 pipe-laying chains, 12 feet, 9 feet and 7 feet.
 1 gearing and drum to derrick.
 8 turned poles for derrick.
 1 2-legged derrick for tunnel use.
 2 2-wheeled pipe trucks with one extra wheel.

4 wheelbarrows for tunnel use.
 1 dirt scraper.
 2 puddling bars and wrench.
 1 crowbar.
 1 crowfoot.
 4 rock gads.
 11 rock drills.
 4 steel wedges.
 3 hoisting buckets.
 3 iron bands with screw bolts.
 1 pipe cutter for 4 to 8-inch.
 1 pipe cutter for 10 to 16-inch.
 10 cutting chisels.
 7 cape chisels.
 12 caulking sets.
 11 yarning tools.

STABLE AND YARD.

4 horses.	2 tape lines.
1 light truck.	3 spirit levels.
2 light wagons.	1 work bench with 2 vises.
2 buggies.	1 anvil.
2 light bob sleighs.	1 log hook.
2 cutters.	2 drag forks.
4 sets single harness.	1 peavy.
5 horse blankets.	3 pairs of grab tongs.
22 pairs bedding blankets.	1 pair of ice tongs.
4 robes.	1 $\frac{3}{4}$ -inch hose for washing buggies.
2 manure forks.	1 sand screen.
Quantity feed for horses.	1 bowl and tank for water closet.
2 farmers' kettles.	1 wash basin with 3 marble slabs.
1 box wood stove.	12 sash weights.
18 pairs rubber boots.	1 handsaw.
23 lanterns.	1 garden rake.
7 tubular lanterns.	2 grub hoes, old.
13 lamp globes, extra.	18 jack screws.
2 tents.	1 drag rake.
1 grindstone.	1 1-inch auger.
1 shovel.	3 branding stamps.
1 wheelbarrow.	1 cast shoe, cone-shaped, for 8-inch pipe.
4 brooms.	1 wheel knife for plow.
2 steel brooms.	6 hydrant caps for $\frac{3}{4}$ -inch hose connection.
1 writing desk.	5 2-inch brass nozzle reducers.
4 1-gallon cans.	3 $2\frac{1}{2}$ -inch hose couplings.
1 5-gallon can.	2 2-inch hose couplings.
2 pairs window sash.	200 feet $2\frac{1}{2}$ -inch hose.
1 beam scale.	1 5-inch hose, 5 feet long.
2 platform scales, Fairbanks'.	150 feet 1-inch rope, new.
5 empty kerosene barrels.	36 feet 1-inch rope, old.
1 spade.	213 feet $\frac{1}{2}$ -inch rope, new.
1 garden hose.	200 feet $\frac{1}{2}$ -inch rope, old.
1 plow.	85 feet $1\frac{1}{4}$ -inch rope, old.
1 sod cutter.	300 feet $\frac{3}{4}$ -inch rope, old.
1 well measure windlass.	
6 wire cable couplings.	

MIDWAY STATION.

Gates—

- 1 6-inch gate box, complete.
- 1 valve rod.
- 3 gate wrenches.

Hydrants—

- 1 S. Mathew hydrant.
- 5 globe valves.
- 1 ring valve.
- 1 valve seat.
- 1 stuffing box.
- 1 revolving nut.
- 2 hydrant wrenches.
- 1 seat wrench.
- 3 monkey wrenches.
- 4 standpipe wrenches.
- 3 files, 14 inches long.
- 1 rasp, 14 inches long.

Pipe-Laying Tools.

- 1 pipe cutter.
- 4 picks.
- 7 shovels.
- 1 set tackle blocks.
- 1 dirt scraper.
- 1 3-legged derrick.
- 1 wheelbarrow.
- 2 16-pound sledges.
- 3 chains, 6 feet long.
- 1 striking hammer.
- 1 pipe rammer.
- 1 tunnelling bar.
- 1 caulking hammer.
- 2 yarning tools.
- 5 caulking sets.
- 6 diamond points.
- 1 cutting chisel.
- 1 cold chisel.

- 3 cape chisels.
- 2 pairs set tongs.
- 1 crowbar.

Connection Stock and Tools—

- 3 1-inch corporation cocks.
- 10 $\frac{3}{4}$ -inch corporation cocks.
- 7 $\frac{1}{2}$ -inch corporation cocks.
- 7 1-inch stop and waste cocks.
- 8 $\frac{3}{4}$ -inch stop and waste cocks.
- 1 stop cock rod.
- 8 stop cock poles.
- 2 faucets with 3 feet pipe.
- 15 brass nipples, $\frac{3}{4}$ -inch to $1\frac{1}{2}$ -inch.
- 1 Muller tapping machine.
- 1 gasoline furnace.
- 2 solder ladles.
- 1 lead ladle.
- 1 shave hook.
- 1 pair $\frac{3}{4}$ -inch pipe tongs.
- 2 pairs plyers.
- 1 turn pin.
- 1 bending iron.

Stable and Miscellaneous—

- 1 truck.
- 1 manure fork.
- 1 garden hose.
- 1 grindstone.
- 25 feet 1-inch rope.
- 4 lanterns.
- 1 work bench with pipe vise.
- 1 spirit level.
- 1 buck saw.
- 1 handsaw.
- 1 mason's trowel.
- 2 small augers.
- 1 row boat.

2 hatchets.
 2 bridge augers.
 1 square.
 1 log carrying hook.
 1 ax.
 1 4-legged derrick.
 6 wheel barrows.
 1 sledge hammer.
 10 mauls.
 2 grub hoes.
 1 sledge.
 8 sand rock picks.
 4 picks.
 20 shovels.
 5 long-handled shovels.
 2 crow bars.
 1 rock gad.
 1 tunneling bar.
 1 sand scoop and handle.
 1 gasoline blower torch.
 2 tool boxes.

1 plug and feather drill.
 4 cape chisels.
 5 cold chisels.
 4 cutting chisels.
 2 diamond points.
 2 yarning tools.
 2 pipe gaskets.
 2 gasket clamps.
 1 monkey wrench.
 3 caulking hammers.
 4 caulking sets.
 1 pair caulking tongs.
 1 pair 2-inch extra pipe tongs.
 1 pair 1½-inch pipe tongs.
 1 lot old rope in pieces.
 1 lot old telephone poles.
 1 large truck for hauling 20 to 30-inch pipes (4 wheeled).
 1 large truck for hauling 12 to 20-inch pipes (2-wheeled).

WEST SIDE PUMPING STATION.

1 24-inch pipe wrench.
 1 14-inch Coe's wrench.
 1 hand saw.
 1 ax.
 1 hatchet.
 3 oil tanks.
 1 1000-pound Fairbanks scale.
 1 vise.
 1 work bench.
 2 coal shovels.
 1 wardrobe.
 1 clock.
 3 large lanterns.
 1 writing desk.
 2 chairs.
 1 gate wrench.

1 steel coal wheelbarrow.
 1 cuspidor.
 1 step ladder.
 1 set engineer 5-piece brass hand
 oilers.
 2½-gallon measures.
 2 hand oilers.
 1 set of wrenches for pumps.
 1 set fire tools.
 25 feet of ¾-inch steam hose.
 1 lawn mower.
 100 feet of ¾-inch garden hose.
 1 hay rake.
 1 4-inch flue cleaner.
 25 feet of 1-inch hose.

VADNAIS LAKE PUMPING STATION.

Gate House—

4 storm windows.
 4 window screens.
 2 brooms.
 1 steel broom.
 1 shovel.
 1 galvanized pail.
 1 ice chisel.
 1 ice saw.
 4 steel traps.
 2 gate wrenches.
 1 gate lock and key
 1 boat chain.
 1 row boat.
 1 pair oars.
 1 pair rubber boots.

Dwelling House—

15 storm windows.
 15 window screens.
 2 screen doors.
 1 thermometer.
 1 hand pump.
 1 kalsomine brush.
 2 storm doors.
 2 ventilators for chimneys.

Pumping Station—

1 heating stove.
 1 8-day clock.
 2 S. wrenches.
 4 monkey wrenches.
 2 Stilson pipe wrenches.
 2 cold chisels.
 4 files.

2 hammers.
 2 hand lanterns.
 5 large globe lanterns.
 1 spirit level.
 1 paint brush.
 1 hand saw.
 1 wooden rod with ball joint for flue.
 1 3-inch steel flue cleaner.
 1 cleaner.
 3 50-gallon oil tanks.
 1 coal pick.
 2 scoop shovels.
 50 feet 1-inch rubber hose and nozzle.
 20 feet 1¼-inch rubber hose and nozzle.
 3 oil cans.
 1 automatic oil tilter.
 1 step ladder.
 1 shovel.
 1 pick.
 1 vise.
 1 steel coal wheelbarrow.
 1 grindstone.
 1 ax.
 1 grub hoe.
 1 brush hook.
 1 draw knife.
 1 writing desk.
 2 chairs.
 1 cuspidor.
 1 iron block plane.
 1 tray brass oiler.
 2 steel oilers.
 1 brace and bit.
 1 belt punch and rivet set.
 1 1384 scale.
 1 Fairbanks platform scale.

BALDWIN LAKE PUMPING STATION.

- | | |
|--|---|
| 1 No. 10 centrifugal pump. | 1 3½-inch steam flue cleaner. |
| 1 force pump for drinking well. | 1 4-inch old gate valve. |
| 1 hand push car. | 1 3-inch old safety valve. |
| 200 lineal feet second-hand light rail-road track. | 12 brass springs. |
| 1 flat boat. | Some old pipe and fittings. |
| 1 set wrenches for pumps. | 2 low pressure pistons. |
| 2 gate wrenches. | 1 old smokestack, 34 inches by 45 feet. |

CENTERVILLE LAKE PUMPING STATION.

- | | |
|------------------------------|--|
| 1 vise. | 2 crow bars. |
| 1 pair pipe tongs. | 6 chisels. |
| 1 24-inch pipe wrench. | 4 files. |
| 1 12-inch pipe wrench. | 2 caulking tools. |
| 1 24-inch Coe's wrench. | 2 steel hand oilers. |
| 1 14-inch Coe's wrench. | 1 No. 3 Blake boiler feed pump. |
| 1 8-inch Coe's wrench. | 1 box stove for wood. |
| 1 hand hammer. | 40 feet stove pipe. |
| 1 coal hammer. | 1 writing desk. |
| 2 saws. | 1 set steel wrenches for pumps. |
| 1 hatchet. | 1 lantern support. |
| 1 ax. | 3 cuspidors. |
| 3 oil tanks. | 8 wooden wheelbarrows. |
| 2 1-quart cans. | 1 empty tool box. |
| 2 3-quart cans. | 1 boat, 16 feet by 4 feet by 14 inches. |
| 1 steel coal wheelbarrow. | 1 sand screen. |
| 2 coal scoops. | 1 post auger. |
| 1 grindstone. | 1 roller toboggan. |
| 6 large lanterns. | 1 gate wrench, 4 feet long. |
| 2 hand lanterns. | 1 gate wrench, 11 feet long. |
| 3 bracket lamps. | 6 granite blocks for monuments. |
| 1 clock. | 1 timber carrier. |
| 1 draw knife. | 200 ½-inch steel bands for wooden conduit. |
| 1 ratchet, brace and bit. | 6 hand braces. |
| 1 chain. | 6 ratchet wrenches. |
| 1 2-ton chain block. | 7 scoop shovels, new. |
| 1 4-inch steam flue cleaner. | 6 chisels. |
| 25 feet 1½-inch rubber hose. | 5 files. |
| 1 pair rubber boots. | 11 straight steel wrenches. |
| 1 ¾-inch auger. | 3 hand hammers. |

CITY ENGINEER'S REPORT.

OFFICE OF CITY ENGINEER,
ST. PAUL, MINN., Jan. 1, 1898.

To the Board of Water Commissioners.

GENTLEMEN: I submit herewith my annual report of the work of construction, surveys, etc., of the water department which has been done under the direction of the engineering department during the year ending Dec. 31, 1897, together with some recommendations for future extensions.

The following statement embraces the principal contracts and construction work during the year:

Fencing right of way of Centerville conduit line, Joseph La-motte, contractor, contract finished.....	\$703.71
Ten million gallon pumping engine for McCarron Lake pumping station, E. P. Allis Co., contractors. Contract price.....	22,700.00
Shop inspection of ten million gallon pumping engine at McCarron Lake pumping station. Contract price.....	850.00
New outlet and weir chamber for Pleasant Lake, gate valve and special castings, South Park Foundry, contractors. Contract price	257.30
Weir chamber and inlet to reservoir for 36-inch force main. Total cost	1,705.25
Thirty-inch Venturi meter for low service main, Builders' Iron Foundry, contractors. Contract price.....	1,151.75
Dwelling house at Centerville Lake pumping station, W. H. Jackson, contractor. Contract finished.....	1,474.00
Boiler for McCarron Lake pumping station, John Kenny, contractor. Contract price	1,223.00
New arrangement of discharge and suction main at McCarron Lake pumping station. Special castings, Howard-Harrison Iron Co., contractors. Contract price.....	945.50
Weir at Vadnais Lake pumping station. Total cost.....	1,253.51
Pipe connection for new artesian wells, Vadnais Lake. Total cost	1,632.29
Foundation and pier for ten million gallon pumping engine at McCarron Lake station. Total estimated cost.....	2,000.00
Expended in 1897.....	1,600.00

from time to time the efficiency of the pump and determine whether the valves are acting properly.

With this weir and the two Venturi meters on the low service line, our annual consumption of water can be determined with great accuracy.

VENTURI METER.

A thirty-inch Venturi meter has been purchased and placed in position on the low service thirty-inch main from Vadnais Lake supply, near the terminal chamber, and we shall now be able to determine more accurately the exact amount of water used on this system, and any unusual leakage or waste can be readily detected. Information thus obtained will also be found very valuable in fixing the rate and determining future extensions. The recording apparatus will be placed in the McCarroll Lake pumping station as soon as the foundation for the new pump is completed.

VADNAIS LAKE PUMPING STATION.

Connections have been made with the two additional artesian wells which were put down last year at the Vadnais Lake pumping station. The total number of artesian wells connected up at this station at the present time is nine; two deep wells, ten inches in diameter, and seven shallow wells, eight inches in diameter, with Cook strainers.

They now furnish, when the plant is in operation, a supply of five million gallons per day. A weir and settling basin has also been put into the discharge pipe between the pumps and the conduit, both to give us an accurate measurement of the water and to determine whether the water cylinders of the pumping engine are filling properly, also to catch any sand pumped from the artesian wells and prevent it from getting into the conduit.

With the addition of the two wells we are getting much better results. The slip of the pump is reduced to about eight per cent, and we are obtaining a duty of fifty-three million foot pounds.

EXTENSION OF THE PHALEN LAKE SYSTEM.

A considerable amount of pipe has been relaid in the district between Broadway and Jackson, and Seventh and Grove streets during the past season, as the old pipes, which were the first laid in the city, were becoming too small for the service. Arrangements were made in laying these pipes so that this district, which can be extended west as far as Cedar street, could be supplied both from the Phalen Lake system and from the Vadnais Lake system. This will increase the amount of water supplied from the Phalen Lake system about forty per cent whenever there is a sufficient amount on hand to supply this increased territory. It can at any time be changed to the Vadnais Lake system by shutting off a few valves.

reliable information may be obtained. The detailed records from which the table is compiled give sufficient evidence of the promptness with which repairs are made when the water wasted by defective plumbing has to be paid for. As no census of the total number of people supplied has been taken, an accurate comparison of the per capita consumption, as per the table, to the actual per capita consumption for the high service cannot be made, but the average metered consumption per service per day as tabulated is only 29 per cent of the actual total for the high service, and assuming the average number of persons per service as obtained from the table, the tabulated per capita consumption would be 28.5 per cent of the actual.

PUMPING PLANTS.

By the completion of the Centerville Lake pumping station there is no necessity to operate the Baldwin Lake plant, but as there is not a large amount of capital invested in this plant, I would recommend that it be kept intact at present as a sort of emergency plant which might be used in case anything should happen to the Centerville Lake plant.

The following compilation of the cost of pumping at the several pumping stations shows an increase of duty over last year, which is accounted for by the greater efficiency of the new boiler at McCarron Lake station, the additional wells at Vadnais Lake, and the greater consumption at the West side station.

COST OF PUMPING AT THE VARIOUS PUMPING STATIONS.

McCARRON LAKE PUMPING STATION.

	Gallons.
Capacity of Pump No. 1.....	2,000,000
Capacity of Pump No. 2.....	4,000,000
Capacity of Pump No. 3.....	6,000,000

	Gallons.	Pounds of Coal.	No. of Gallons Per Pound of Coal.
Pumps Nos. 1 and 2.....	124,229,200	256,084	485
Pump No. 3.....	1,156,083,140	1,818,124	635
	<hr/> 1,280,312,340	<hr/> 2,074,208	<hr/> 617

Average duty during the year for Engines Nos. 1 and 2.....	58,998,151
Average duty during the year for Engine No. 3.....	77,332,747
Average duty during the year for the whole plant.....	75,069,147

		Cost of Raising 1,000,000 Gallons One Foot
Salaries for 1897.....	\$3,600.00	\$0.019260
Fuel	3,968.92	0.021233
Waste, oil and repairs.....	339.13	0.001814
Total	<hr/> \$7,908.05	<hr/> \$0.042307

To utilize these two lakes and the drainage area to the best advantage, I would recommend again that plans be prepared to cut off the rest of the Rice Lake system by a dam between Peltier Lake and Rice Lake, and that a dredge be bought and put in operation on Centerville and Peltier lakes to excavate a deep connection between these lakes and to remove all the weeds and vegetable matter around the edges of the lakes and deepen them so as to prevent the growth of vegetation during warm weather. By making yearly appropriations for this work we shall be able to get the lakes in proper condition by the time it becomes necessary to draw largely for our water supply, and after this is done a proper connection can be made with Clear Lake and with Forest Lake so that the overflow from Forest Lake can be brought down into this system, and I would further recommend that steps be taken at once to condemn the land which may be necessary for carrying out these plans. The recent suits brought against the water board show that it will be necessary to go through the form of condemnation, even if the property about the lake should be greatly benefited by the improvement.

BALD EAGLE LAKE EXTENSION.

The water in Otter Lake is now under control of the water department and can be turned at any time into the Pleasant Lake system by opening a gate. Bald Eagle Lake is only separated from Otter Lake by about 2,000 feet of low marshy land which can be easily ditched. In fact, there was formerly a connection between these lakes which has grown up with weeds. I would recommend that the proper condemnation be made at once so the control may be obtained of the overflow of Bald Eagle Lake, which now runs into the Rice Lake system. This surplus water could then be turned into Pleasant Lake in the spring when that lake is usually low on account of the draft made on it for the water consumption during the winter. It would not be necessary to draw Bald Eagle Lake below its normal condition, but merely to utilize the surplus overflow which now goes in another direction.

Respectfully submitted,

L. W. RUNDLETT,
City Engineer.

AR 1897.

LOW SERVICE.

Low Service.		West St. Paul High Service.		Total Low Service.	
	Daily Average.	Total.	Daily Average.	Total.	Daily Average.
27,745	3,917,024	475,920	15,352	121,903,665	3,932,376
3,570	3,815,486	402,660	14,380	107,236,230	3,829,866
1,723	3,852,959	429,480	13,854	119,871,180	3,866,813
1,740	3,796,724	618,660	20,623	114,520,400	3,817,347
7,680	4,562,506	1,979,280	68,847	143,416,960	4,626,353
8,740	4,237,958	1,613,520	53,784	128,752,260	4,291,742
0,753	3,919,380	1,939,500	62,564	123,440,253	3,981,944
1,880	3,382,640	2,053,980	66,257	105,365,860	3,396,897
4,741	3,315,157	2,851,880	78,396	101,806,621	3,393,553
4,113	3,027,552	2,173,180	70,263	96,032,293	3,097,815
0,600	3,584,350	1,251,000	41,700	108,781,600	3,626,050
8,260	3,892,202	724,140	23,359	121,382,400	3,915,561
1,545	3,771,209	16,018,200	43,886	1,392,509,722	3,815,095

ST. PAUL WATER WORKS PUMPING STATION, MCCARRON LAKE.

ENGINEER'S REPORT FOR YEAR ENDING DECEMBER 30, 1897.

MONTHS—1897.	NUMBER OF HOURS PUMPED.			NUMBER OF REVOLUTIONS.			NUMBER OF GALLONS PUMPED.			Average per Day	Total Coal Used per	Average Coal Used
	Eng. No. 1.	Eng. No. 2.	Eng. No. 3.	Eng. No. 1.	Eng. No. 2.	Eng. No. 3.	Eng. No. 1.	Eng. No. 2.	Eng. No. 3.			
January.....	288	554	554	582,000	404,800	404,800	39,					
February.....	78	598	598	208,000	500,300	500,300	0,611,300					
March.....		744	744		698,700	698,700						
April.....		716	716		908,100	908,100						
May.....		710	710		852,800	852,800						
June.....	92	630	630	133,700	334,000	701,900	4,278,400	22,				
July.....	162½	672	672	18,000	143,100	771,500	545,500	9,				
August.....	7	744	744		845,000	845,000						
September.....	80	588	588	122,200	194,800	623,900	3,010,400	13,				
October.....	47	672	672		89,800	743,600						
November.....	125	538	538		246,100	548,200						
December.....		731	731		883,000	883,000						
Total.....	216	792½	7,040	481,100	1,640,500	3,015,300	108,					

Total gallons pumped..... 1,290,312,700
 Daily average gallons pumped..... 3,507,500
 Total pounds of coal used..... 2,089,810
 Daily average coal used..... 5,725
 Daily decrease since 1896—Gal. 663,315

MARTIN FEIST.

Chief Engineer.

ST. PAUL WATER WORKS PUMPING STATION, WEST SIDE.
ENGINEER'S REPORT FOR YEAR ENDING DECEMBER 31, 1897.

Total number gallons pumped....	16,018,200
Daily average gallons pumped.....	43,885
Total pounds of coal used.....	229,800
Daily average coal used.....	620
Daily increase since 1896....	10,064

ST. PAUL WATER WORKS PUMPING STATION, VADNAIS LAKE.

ENGINEER'S REPORT FOR YEAR ENDING DECEMBER 31, 1897.

MONTHS.	Number of Hours Pumped.	Number of Revolu- tions.	Number of Gallons Pumped.	Daily Average Gallons Pumped.	Total Coal Used.	Daily Aver- age Coal.	Aver- age on Suc- tion.
1897.							
January							
February							
March							
April							
May							
June							
July							
August	60	154,400	13,587,200	4,529,066	8,800	2,768	10 1/2
September	668	1,556,200	136,945,600	4,890,914	74,500	2,660	10 1/2
October	674 1/2	1,548,200	136,241,000	4,865,771	76,500	2,732	10 1/2
November	299	716,200	63,025,600	5,058,888	36,650	2,756	10 1/2
December							
Total	1,710 1/2	3,975,000	349,800,000	4,836,159	195,950	2,728	10 1/2
Total gallons pumped.....					349,800,000		
Daily average gallons pumped.....					4,836,159		
Total pounds of coal used.....					195,950		
Daily average coal used.....					2,728		

ST. PAUL WATER WORKS PUMPING STATION,
CENTERVILLE LAKE.
ENGINEER'S REPORT FOR YEAR ENDING DECEMBER 31, 1897.

MONTHS.	Number of Hours Pumped.	Number of Revolu- tions.	Number of Gallons Pumped.	Daily Average Pumped	Total Pounds Coal Used.
1897.					
January	38¾	35,900	12,995,800	1,443,977	22,300
February					*5,100
March					*8,350
April					
May	5	5,760	2,085,120		1,600
June	7½	9,018	3,264,516	652,915	3,285
July	41½	43,821	15,863,202	1,586,320	8,300
August	118½	187,827	67,993,374	7,570,463	26,390
September					
October	23¼	22,844	8,269,528		4,700
November	5	5,041	1,824,842		†1,200
December					
Total	230½	310,211	112,206,382		81,225

*Coal for heating building.
†Testing well.

Total gallons pumped..... 112,205,278
Total pounds coal used..... 81,225

CITY TREASURER'S REPORT.

OFFICE OF THE CITY TREASURER,
ST. PAUL, MINN., Jan. 22, 1898.

To the Honorable Board of Water Commissioners,

GENTLEMEN: I herewith submit the annual report of the receipts and disbursements of the water department for the year ending Dec. 31, 1897.

RECEIPTS.

Balance on hand Jan. 1, 1897.....	\$12,189.92
Cash	804,459.11

DISBURSEMENTS.

Cash	\$301,748.55	
Balance on hand Jan. 1, 1898.....	14,900.48	
	<hr/>	<hr/>
	\$316,649.03	\$316,649.03

WATER DEPARTMENT SINKING FUND.

CR.

Balance on hand Jan. 1, 1897.....	\$2,090.71
Cash invested by Water Board.....	75,000.00
Cash for redeemed tax levy certificates of indebtedness	303,500.00
Cash interest on bonds.....	2,000.00
Cash interest on certificates of indebtedness.....	19,535.03
General fund interest on \$49,250 to September 1st	175.11
General fund error on June 19, 1897.....	11.92
General fund interest on balance October, 1896, to March, 1897	37.11

DR.

To investment in registered city bonds.....	\$150,000.00	
To tax levy certificates of indebtedness.....	304,000.00	
To interest on balance overdrawn account.....	824.80	
To balance on hand Jan. 1, 1898.....	7,525.08	
	<hr/>	<hr/>
	\$462,349.88	\$462,349.88

Respectfully submitted,

C. L. HORST,
City Treasurer.

SEVENTEENTH ANNUAL REPORT

OF THE

BOARD

OF

WATER COMMISSIONERS

OF THE

CITY OF ST. PAUL

JANUARY 1, 1899

**ST. PAUL, MINN.
THE PIONEER PRESS COMPANY.
1899.**

OFFICERS
OF THE
CITY WATER WORKS.

JANUARY 1, 1899.

— — — — —

BOARD OF WATER COMMISSIONERS.

JOHN H. WOLTERSTORFF, President. Term expires Jan. 1, 1901.
R. B. C. BEMENT. Term expires Jan. 1, 1901.
J. F. HOYT. Term expires Jan. 1, 1900.
P. W. HUDNER. Term expires Jan. 1, 1902.
JNO. M. CARLSON. Term expires Jan. 1, 1903.

— — — — —

JOHN CAULFIELD, Secretary.
A. R. STARKEY, Superintendent.
L. W. RUNDLETT, City Engineer and Engineer of the Board.
MARTIN FEIST, Chief Engineer and Engineer of McCarron Lake Station.
M. THOMMES, Assistant Engineer of McCarron Lake Station.
FRED KOPHINGST, Assistant Engineer of McCarron Lake Station.
H. GEISLER, Gate Keeper and Engineer of Vadnais Lake Station.
A. A. THOMPSON, Assistant Engineer of Vadnais Lake Station.
JACOB ABRESCH, Engineer of Centerville Station.
JOS. DOERR, Engineer of West St. Paul Station.
R. H. JOHNSTON, Assistant Engineer of West St. Paul Station.
GEO. DOORLEY, Meter Inspector.

SECRETARY'S REPORT.

Office of the Board of Water Commissioners,
St. Paul, Minn., Jan. 1, 1899.

To the Board of Water Commissioners.

GENTLEMEN: I herewith submit my seventeenth annual report, with accompanying statements and tables, showing in detail, under appropriate headings, the financial operations of the water department for the year ending Dec. 31, 1898; also, comparative statements of receipts and disbursements from Aug. 10, 1882 (the time of the purchase of the works by the city), to date.

REVENUE. (See Table No. 2.)

Balance on hand Jan. 1, 1897.....	\$15,104.43
General water receipts.....	\$167,154.27
Miscellaneous water receipts.....	15,084.87
Connection (street services).....	10,355.09
Extensions	770.74
Construction (new supply).....	243.39
Frontage tax	103,927.35
Shutting off and turning on water.....	46.00
Sinking fund earnings.....	16,878.94
Sinking fund	379.08
Meter	292.16
Repair	60.70
	315,192.59
Total	\$330,297.02

DISBURSEMENTS. (See Table No. 2.)

General maintenance	\$38,124.41
Construction (street services).....	10,323.24
Repairs	2,273.62
Meters	12,533.49
Extensions	19,128.60
Construction	54,396.92
Interest	114,200.00
Frontage tax refunded.....	476.44
Sinking fund	68,378.94
Sinking fund earnings.....	379.08
	320,214.74
Total	\$320,214.74
Balance	\$10,082.28

10 ANNUAL REPORT OF WATER COMMISSIONERS

tained and as tabulated is most interesting and valuable to the department.

SERVICES. (See Table No. 12.)

During the year 530 applications have been made for service connections, of which 401 were on high service and 129 on low service. Total number of applications to date is 15,742, of which 9,230 are on high service and 6,512 on low. There were but 2,012 applications, and all on low service, when the city purchased the works in 1882. Table No. 12 shows the number of applications made for water services annually from 1869 to date.

PLUMBING AND INSPECTION. (See Table No. 18.)

Forty-seven plumbers were granted licenses during the year, and 1,104 permits were issued to them to do work in connection with the introduction and extension of water services. In addition to the inspection and examination of all the work done by licensed plumbers, there were 612 special inspections, of which 345 were on high service and 267 on low. These inspections were made at the request of consumers for change of rate.

Table No. 18 shows the character and number of hose violations reported to this department during the past season, and also the comparative statement for the years 1894 to 1898, inclusive. This table also shows the number of permits issued annually to plumbers since 1884.

Respectfully submitted,

JNO. CAULFIELD,

Secretary.

TABLE NO. 1.

TRIAL BALANCE DEC. 31, 1898.

Account—	Dr.	Cr.
St. Paul water works (original purchase).....	\$510,000.00	
Bond account		\$2,460,000.00
General water receipts.....		2,388,642.29
Miscellaneous water receipts.....		282,381.86
Connectlon (services)		5,351.04
Extension (pipe lines and works inside of city)	2,001,663.25	
General maintenance	471,496.72	
Repair	58,373.71	
Meter	71,443.37	
Construction (works outside of city).....	1,317,307.26	
Interest	1,518,942.61	
General water receipts (hydrant account).....		121,663.19
Sinking fund	529,524.94	
Sinking fund earnings		84,361.75
Shutting off and turning on water.....		2,282.00
Frontage tax		1,144,152.01
Bank of Minnesota.....	250.76	
C. L. Horst, city treasurer.....	9,831.52	
	<hr/>	<hr/>
	\$6,488,834.14	\$6,488,834.14

TABLE NO. 2.

RECEIPTS AND DISBURSEMENTS FROM JAN. 1, 1898, TO DEC. 31, 1898.			
RECEIPTS.			
Balance Jan. 1, 1898.....			\$15,194.43
General water receipts, high service.....	\$40,522.77		
General water receipts, low service.....	39,204.47		
General water receipts, meters	67,367.03		
		\$107,154.27	
Miscellaneous receipts, builders	\$579.18		
Miscellaneous receipts, flushing sewers.....	356.67		
Miscellaneous receipts, filling cisterns.....	321.50		
Miscellaneous receipts, sprinkling streets...	13,827.52		
		15,084.87	
Connections (services).....		10,355.09	
Shutting off and turning on water.....		46.00	
Extension		770.74	
Frontage tax.....		103,927.35	
Sinking fund earnings.....		16,878.94	
Sinking fund.....		379.08	
Meter		292.16	
Repairs		60.70	
Construction (new supply).....		243.30	
			315,192.59
Total receipts.....			\$330,297.02
DISBURSEMENTS.			
General Maintenance—			
Salaries	\$21,555.12		
Stationery and printing.....	1,820.77		
Miscellaneous	1,080.98		
Labor	7,009.51		
Material	5,750.63		
Stable-feed	425.67		
Stable-repairs	472.73		
		\$38,124.41	
Connections—			
Labor	6,214.30		
Pipe	2,780.81		
Brass goods and stop boxes.....	1,129.11		
Tools and miscellaneous.....	190.02		
		10,323.24	
Repairs—			
Hydrants—labor	\$1,401.64		
Hydrants—material	69.21		
Valves—labor	214.72		
Valves—material	7.77		
Mains—labor	504.04		
Mains—material	76.24		
		2,273.62	
Meters—			
Labor and material.....	\$3,640.12		
Freight and meters.....	8,884.37		
		12,533.49	
Extensions—			
Pipe and special castings.....	\$7,146.21		
Labor and contracts.....	8,061.99		
Tools and repairs of same.....	106.77		
Advertising	8.50		
Fire hydrants.....	315.00		
Valves	879.26		
Lead and hemp packing.....	676.17		
Lumber and material... ..	923.82		
Miscellaneous	1,010.88		
		19,128.00	
Construction—New Supply—			
Pipe and special castings.....	\$1,907.48		
Labor and contracts.....	42,908.52		
Tools and repairs of same.....	120.47		
Lumber and material.	3,009.88		
Freight	134.65		
Engineering and right of way.....	4,445.31		
Miscellaneous and building account.	1,870.61		
		54,396.92	
Interest		114,200.00	
Refunded frontage tax... ..		476.44	
Sinking fund.....		68,378.94	
Sinking fund earnings		379.08	
Total disbursements.....			320,214.74
Balance			\$10,082.28

TABLE NO. 3.

RECEIPTS AND DISBURSEMENTS FROM AUG. 10, 1882, TO DEC. 31, 1898.

RECEIPTS.

General water receipts, high service.....	\$670,916.36	
General water receipts, low service.....	958,617.30	
General water receipts, meters	753,108.63	
		\$2,388,642.29
Miscellaneous receipts, builders	\$38,495.29	
Miscellaneous receipts, water carts.....	3,796.13	
Miscellaneous receipts, flushing sewers.....	12,273.06	
Miscellaneous receipts, filling cisterns.....	20,840.09	
Miscellaneous receipts, sprinkling streets...	206,977.29	
		282,381.86
Connections (services).....		311,909.65
Shutting off and turning on water.....		2,282.00
Extension		33,733.59
Interest		67,964.84
Frontage tax.....		1,147,316.49
Sinking fund earnings.....		92,140.16
Sinking fund.....		7,778.41
Meter		437.77
Repairs		3,319.85
Construction (new supply).....		5,937.65
Bills payable.....		653,000.00
Bonds		2,110,000.00
General water receipts, hydrant account...		121,663.19
Total receipts.....		\$7,228,507.73

TABLE NO. 3—Continued.

DISBURSEMENTS.

General Maintenance—		
Salaries	\$254,081.00	
Stationery and printing	18,278.18	
Miscellaneous	10,815.37	
Labor	60,001.38	
Material	100,338.44	
Stable—feed	0,118.80	
Stable—repairs	4,372.48	
		\$471,406.72
Connections—		
Labor	\$175,473.08	
Pipe	40,632.80	
Brass goods and stop boxes	41,087.21	
Tools and miscellaneous	8,785.52	
		\$301,558.61
	\$30,153.00	
	1,888.10	
	1,005.37	
	554.70	
	10,000.73	
	2,331.70	
		\$1,000.50
	\$22,614.00	
	49,280.24	
		\$71,894.24
Extensions—		
and special castings	\$1,075,002.33	
facts	640,303.52	
in of same	20,104.83	
.....	200.50	
Valves	98,000.73	
Lead and hen	80,000.48	
	68,320.40	
	24,440.25	
	20,372.72	
		\$2,005,390.84
Construction—New Supply—		
Pipe and special castings	\$180,700.81	
Labor and contracts	710,910.20	
	7,400.40	
	100,710.00	
	0.718.38	
Engineering and right of way	131,186.07	
Miscellaneous and building account	21,017.10	
Reservoirs	147,484.77	
		\$1,320,244.81
Interest		1,580,007.45
Refunded frontage tax		3,104.48
Bills payable		653,000.00
Sinking fund		537,503.35
Sinking fund earnings		7,778.41
Bond		100,000.00
Total disbursements		7,218.42
Balance		\$10.08

ER 31, 1898.

lon. ly.)	Bills Payable.	Bond
.21		
.43		
.50		
.25		
.39		

1, 1898.

	\$17,000.00	
.15	111,000.00	\$150,000
.18	165,000.00	600,000
.90	50,000.00	400,000
.90	55,000.00	
.50	95,000.00	200,000
.29		300,000
.91		350,000
	105,000.00	100,000
.50	20,000.00	
.00	35,000.00	
.73		
.70		
.50		
.00		
.39		
.65	\$653,000.00	\$2,110,000

TABLE NO. 4.

STATEMENT SHOWING AMOUNT PAID THE CITY TREASURER FROM
JAN. 1, 1898, TO DEC. 31, 1898.

January 1.	Balance in treasury as per last report.....		\$14,822.33
January.	Cash.....	\$24,082.86	
February.	Cash.....	13,399.94	
March.	Cash.....	45,395.97	
April.	Cash.....	10,448.98	
May.	Cash.....	8,590.83	
June.	Cash.....	37,783.35	
July.	Cash.....	22,796.03	
August.	Cash.....	59,648.07	
September.	Cash.....	30,006.38	
October.	Cash.....	12,524.22	
November.	Cash.....	15,133.96	
December.	Cash.....	18,155.30	
		-----	\$297,965.91
	Total		\$312,788.24

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TABLE NO. 5.

WARRANTS DRAWN ON CITY TREASURER FROM JAN. 1, 1898, TO DEC. 31, 1898, INCLUSIVE.

1898.

Jan.	1.	Warrant Nos. 9269 and 9270.....	\$9,112.90		
Jan.	8.	Warrant Nos. 9271 to 9320 inclusive..	3,689.27		
					\$12,802.17
Feb.	1.	Warrant Nos. 9321 to 9334 inclusive..	\$7,668.13		
Feb.	11.	Warrant Nos. 9335 to 9377 inclusive..	7,763.50		
					15,431.63
Mar.	1.	Warrant Nos. 9378 to 9390 inclusive..	\$3,571.21		
Mar.	12.	Warrant Nos. 9391 to 9431 inclusive..	27,018.84		
Mar.	25.	Warrant Nos. 9432 to 9435 inclusive..	12,153.93		
					42,743.98
April	1.	Warrant Nos. 9436 to 9448 inclusive..	\$6,420.32		
April	7.	Warrant Nos. 9449 to 9497 inclusive..	11,981.47		
April	22.	Warrant Nos. 9498 to 9504 inclusive..	2,055.24		
					20,457.03
May	2.	Warrant No. 9505	\$3,588.10		
May	10.	Warrant Nos. 9506 to 9555 inclusive..	7,913.98		
May	19.	Warrant Nos. 9556 to 9567 inclusive..	7,021.96		
					18,524.04
June	1.	Warrant Nos. 9568 to 9588 inclusive..	\$5,439.68		
June	6.	Warrant Nos. 9589 to 9640 inclusive..	28,997.55		
June	23.	Warrant No. 9641	5,850.00		
					40,287.23
July	1.	Warrant Nos. 9642 to 9655 inclusive..	\$5,701.95		
July	8.	Warrant Nos. 9656 to 9706 inclusive..	5,334.42		
July	12.	Warrant No. 9707	3,750.00		
					14,796.37
Aug.	1.	Warrant No. 9708	\$5,059.91		
Aug.	6.	Warrant Nos. 9709 to 9805 inclusive..	39,965.55		
Aug.	20.	Warrant Nos. 9806 to 9818 inclusive..	533.87		
					45,559.33
Sept.	1.	Warrant No. 9819	\$5,158.38		
Sept.	10.	Warrant Nos. 9820 to 9874 inclusive..	27,407.59		
					32,625.97
Oct.	1.	Warrant No. 9875	\$4,972.22		
Oct.	7.	Warrant Nos. 9876 to 9940 inclusive..	13,508.53		
Oct.	16.	Warrant No. 9941	97.41		
					18,638.16
Nov.	1.	Warrant Nos. 9942 to 9962 inclusive..	\$10,288.64		
Nov.	1.	Warrant No. 9963	4,434.28		
Nov.	10.	Warrant Nos. 9964 to 10011 inclusive..	2,497.70		
Nov.	18.	Warrant Nos. 10013 to 10020 inclusive.	814.15		
Nov.	19.	Warrant No. 10012	100.00		
					18,134.77
Dec.	1.	.....	\$4,204.07		
Dec.	2.	.....	1,163.48		
Dec.	3.	.....	6,500.00		
Dec.	8.	.....	10,908.49		
Dec.	10.	.....	100.00		
					22,966.04
Grand total.....					302,956.72
Balance					\$9,831.52

TABLE NO. 6.

**CONTRACTS MADE BY THE BOARD OF WATER COMMISSIONERS FROM
JAN. 1, 1898, TO DEC. 1, 1898.**

No.	Date.	With Whom and for What Purpose.	Amount of Contract.	Amount Paid.	Amount Due.
1.	Jan. 15.	Pioneer Press Co., printing annual report for 1897.....	\$296.58	\$296.58	
2.	Jan. 31.	Northwestern Telephone Exchange Co., telephone.....	56.50		56.50
3.	Feb. 1.	Pittsburg Meter Co., water meters....	6,192.00	6,192.00	
4.	Mar. 28.	The Western Supply Co., brass goods.	337.73	337.73	
5.	Mar. 28.	The Western Supply Co., lead pipe and block tin	1,754.68	1,754.68	
6.	Mar. 28.	South Park Foundry & Machine Co., special castings.....	491.70	491.70	
7.	Mar. 28.	South Park Foundry & Machine Co., street sprinkling hydrants and man-hole covers.....	39.00	39.00	
8.	May 11.	Howard-Harrison Iron Co., Bessemer, Ala., 6-inch to 16-inch cast iron pipe	4,442.86	4,442.86	
9.	May 11.	Ohio Pipe Co., Columbus, O., 30-inch and 36-inch cast iron pipe.....	2,891.47	2,891.47	
10.	May 11.	South Park Foundry & Machine Co., fire hydrants	315.00	315.00	
11.	May 11.	P. H. Thornton, laying water pipe. ..	4,577.09	3,790.00	787.00
12.	May 12.	Western Supply Co., pig lead.....	603.45	603.45	
13.	May 13.	St. Paul Cartage Co., drayage.....	425.26	425.26	
14.	May 13.	South Park Foundry & Machine Co., water gates	796.50	796.50	
15.	May 27.	Jno. J. Bailey, plumbing at Union Park station	121.00	121.00	
16.	June 8.	John Martin Lumber Co., lumber for Pleasant lake conduit.....	602.07	602.07	
17.	June 8.	C. H. Kline, brick for Pleasant lake conduit	1,005.26	1,005.26	
18.	June 8.	N. W. Lime Co., Portland cement for Pleasant lake conduit.....	184.98	184.98	
19.	June 8.	D. L. Bell, American cement for Pleasant lake conduit.....	706.42	706.42	
20.	June 8.	Gribben Lumber Co., lumber for Pleasant lake conduit.....	322.52	322.52	
21.	July 1.	Martinson & Sundberg, laying brick and conduit, Pleasant lake conduit...	359.38	359.38	
22.	July 13.	Thos. Brennan Lumber Co., lumber for Wilkinson lake flume.....	700.47	700.47	
23.	Sept. 22.	Thos. Brennan Lumber Co., lumber for Pleasant lake gate-house.....	159.69	159.69	
24.	Sept. 27.	Crane-Ordway Co., lead pipe and block tin	630.45	630.45	
25.	Oct. 31.	Chas. Nitz Wood & Coal Co., coal and wood	5,074.00	224.72	4,849.28
26.	Oct. 24.	Gribben Lumber Co., lumber for intake, Pleasant lake.....	202.01	202.01	
			<u>\$32,888.07</u>	<u>\$27,105.29</u>	<u>\$5,002.78</u>

TABLE NO. 6—Continued.

CONTRACTS MADE PREVIOUS TO DEC. 31, 1897, AND FOR WHICH
FINAL SETTLEMENT WAS NOT MADE AT TIME OF LAST REPORT.

Date of Contract.	With Whom and for What Purpose.	Amount Due Dec. 31, 1897.	Amount Paid.	Amount Due.
1896.				
April 20.....	E. P. Allis Co., Milwaukee, Wis., pumping engine, Centerville.....	\$350.00	\$350.00	
May 20.....	Hennessey & Cox, wooden conduit to Centerville	1,500.00	1,500.00	
July 8.....	Hennessey & Cox, pump house, Centerville	50.00	50.00	
1897.				
May 5.....	E. P. Allis Co., Milwaukee, Wis., 10-million engine, McCarron Lake station	28,700.00	28,500.00	\$200.00
May 22.....	Fairbanks, Morse & Co., laying water main on Smith avenue.....	65.10	65.10	
May 22.....	Fairbanks, Morse & Co., laying and re-laying water pipes.....	482.66	482.66	
May 22.....	P. H. Thornton, laying water mains...	42.27	42.27	
June 3.....	James Shiely, drayage.....	56.54	56.54	
Mar. 26.....	Pittsburg Meter Co., water meters.....	476.00	476.00	
May 27.....	Robert W. Hunt & Co., Chicago, inspecting 10-million pump, McCarron Lake station	800.00	800.00	
July 1.....	N. W. Fuel Co., coal and wood.....	4,366.28	4,366.28	
Aug. 25.....	Bullders' Iron Foundry, Providence, R. I., 30-inch Venturi meter.....	1,151.75	1,151.75	
Oct. 23.....	John Kenny, boiler for McCarron Lake station	1,223.00	1,223.00	
Oct. 25.....	Howard-Harrison Iron Co., Bessemer, Ala., cast iron specials.....	945.50	945.50	
Dec. 2.....	J. F. Moulton, Minneapolis, Minn., 25,000 paving brick.....	350.00	350.00	
Dec. 6.....	Minneapolis & Kettle River Sandstone Co., stone for 10-million gallon pumping engine	554.56	554.56	
		<u>\$41,113.06</u>	<u>\$40,913.06</u>	<u>\$200.00</u>

TABLE NO. 7.

BOND ACCOUNT JANUARY 1, 1899.

Date of Legislative Act Author- izing Issue of Bonds.	Amount of Bonds Author- ized.	Date of Bonds Issued.	When Due.	Amount of Bonds Issued.	Rate.	INTEREST PAYABLE.											Total Annual Interest		
						Dec. 1.	Jan. 2.	Feb. 1.	Mar. 2.	April 1.	May 2.	June 1.	July 2.	Aug. 1.	Sept. 1.	Oct. 1.		Nov. 2.	
Feb. 10, 1881	\$200,000	June 1, 1882	30 years	\$350,000	4 per cent	\$7,000						\$7,000							\$14,000
Jan. 26, 1883	500,000	Aug. 1, 1883	30 years	150,000	5 per cent			\$3,750						\$3,750					7,500
Feb. 21, 1885	800,000	April 1, 1884	(25 30 years	600,000	5 per cent					\$15,000						\$15,000			30,000
Jan. 31, 1887	200,000	April 1, 1885	30 years	400,000	5 per cent					10,000						10,000			20,000
Jan. 31, 1887	100,000	May 2, 1887	20 years	200,000	4½ per cent						\$4,500							\$4,500	9,000
Mar. 29, 1889	300,000	Mar. 1, 1888	30 years	300,000	4½ per cent				\$6,750							\$6,750			13,500
		Jan. 1, 1889	30 years	100,000	4½ per cent		\$2,250						\$2,250						4,500
		Jan. 2, 1889	30 years	100,000	4½ per cent		3,000						3,000						7,200
		May 1, 1889	30 years	100,000	4½ per cent						2,250							2,250	4,500
		May 1, 1890	30 years	100,000	4 per cent						2,000							2,000	4,000
	2,500,000			\$2,400,000		\$7,000	\$5,850	\$3,750	\$6,750	\$25,000	\$8,750	\$7,000	\$5,850	\$3,750	\$6,750	\$25,000	\$8,750	\$114,200	

TABLE NO. 8.

STATEMENT SHOWING AMOUNT DUE THE BOARD OF WATER COMMISSIONERS ON DEC. 31, 1898, FROM CITY OF ST. PAUL.

Water for fire purposes from Dec. 1, 1891, to June 1, 1892.....	\$28,401.53	
Water for fire purposes from June 1, 1892, to Dec. 1, 1892	29,229.79	
Water for fire purposes from Dec. 1, 1892, to June 1, 1893	30,546.89	
Water for fire purposes from June 1, 1893, to Dec. 1, 1893	31,907.77	
Water for fire purposes from Dec. 1, 1893, to June 1, 1894	31,773.12	
Water for fire purposes from June 1, 1894, to Dec. 1, 1894	32,307.00	
Water for fire purposes from Dec. 1, 1894, to June 1, 1895	32,700.16	
Water for fire purposes from June 1, 1895, to Dec. 1, 1895	33,204.95	
Water for fire purposes from Dec. 1, 1895, to June 1, 1896	33,341.64	
Water for fire purposes from June 1, 1896, to Dec. 1, 1896	33,509.57	
Water for fire purposes from Dec. 1, 1896, to June 1, 1897	33,663.27	
Water for fire purposes from June 1, 1897, to Dec. 1, 1897	33,823.91	
Water for fire purposes from Dec. 1, 1897, to June 1, 1898	33,978.33	
Water for fire purposes from June 1, 1898, to Dec. 1, 1898	34,184.94	
	<u>\$452,273.07</u>	
Premiums received and retained by city on the \$100,000 of bonds issued in January, 1899, to redeem the bonds of the old St. Paul Water Company of like amount assumed by the city at the time the the works	5,398.77	
of grade		
On Mt. Airy between Vail y and Warren	\$248.12	
On Fairview between Jackson and Mt. Airy. .	174.25	
On	399.75	
On and and Olive ..	674.37	
On Flaudrau at	65.00	
Changing main at Como bridge	790.58	
Lowering main on Grand avenue ..	04.00	
	<u>2,376.07</u>	
For water for flushing sewers and washing asphalt paved streets in 1898.	1,067.00	
For water for park fountains, season 1898	\$285.00	
For water for drinking fountains, season 1898. .	676.00	
	<u>1,571.00</u>	
		\$462,670.91
From Board of Education—		
Schools from May 1, 1898, to Jan. 1, 1899 ..	1,801.91	
Repairing water	316.29	
(contractors claims filed with city comptroller)		2,118.20
Balance frontage tax assessment for 1894 and prior	\$12,761.91	
Balance frontage tax assessment for 1895 ..	7,484.67	
Balance frontage tax assessment for 1896 ..	10,305.75	
Balance frontage tax assessment for 1897 ..	25,009.40	
For frontage tax assessment for 1898.	93,075.68	
	<u>148,617.47</u>	
From builders	\$50.00	
From service connections	148.80	
Street sprinkling, 1896.	174.47	
Street sprinkling, 1897	1,781.46	
Street sprinkling, 1898	13,023.87	
	<u>15,783.60</u>	
Total		\$629,390.19

TABLE NO. 9.

FRONTAGE TAX ACCOUNT COLLECTIONS—BALANCE DUE JAN. 1, 1899.

Receipts for Years.	1894 and Prior.	1895.	1896	1897.	1898.	Total.
March 12, 1898.....	\$28.99	\$1,786.04	\$7,657.20	\$2,902.90	.....	\$12,375.91
June 8, 1898.....	.....	.....	.....	25,000.00	.....	25,000.00
August 1, 1898.....	595.93	804.74	7,901.97	35,136.73	.....	44,529.39
August 4, 1898.....	.....	.....	.....	1,950.00	.....	1,950.00
October 5, 1898.....	.....	.....	.....	3,750.00	.....	3,750.00
November 21, 1898.....	.....	.....	.....	7,000.00	.....	7,000.00
December 7, 1898.....	304.94	1,582.02	4,161.00	3,213.40	.....	9,322.05
Total receipts.....	989.88	4,263.40	19,720.95	\$78,953.12	.....	\$103,927.35
Amount due Jan. 1, 1898, as per last report.....	13,751.79	11,748.07	30,116.70	104,052.58	.....	159,669.14
.....	.....	.....	.....	.....	.....	\$55,741.79
Amount of 1898 assess- ment collectible in 1899..	.....	.....	.....	.....	\$93,075.68	\$93,075.68
Amount due Jan. 1, '99.	\$12,761.91	\$7,484.67	\$10,395.75	\$25,000.40	\$93,075.68	\$148,817.47

TABLE NO. 10.
SINKING FUND INVESTMENTS IN TAX LEVY CERTIFICATES AND CITY BONDS.

DATE OF INVESTMENT.	DATE OF CERTIFICATES.	WHEN DUE.	CERTIFICATE NUMBERS.	No of Cert.	Interest.	Amount of Certificates.
Mar. 1, 1897.	Mar. 1, 1897.	Mar. 1, 1897.	1 city bond.	1	4%	\$100,000.00
Sept. 1, 1897.	Sept. 1, 1897.	Sept. 1, 1897.	1 city bond.	1	4%	50,000.00
Jan. 15, 1898.	Jan. 15, 1898.	June 15, 1899.		15	4%	7,500.00
Oct. 15, 1898.	Sept. 15, 1898.	Nov. 15, 1899.	1704 to 1827 inclusive.	224	4%	112,000.00
Nov. 3, 1898.	Nov. 1, 1898.	Nov. 1, 1898.	1 city bond.	1	3 1/2%	100,000.00
Nov. 3, 1898.	Nov. 1, 1898.	Nov. 1, 1898.	1 city bond.	1	3 1/2%	100,000.00
Nov. 3, 1898.	Nov. 1, 1898.	Nov. 1, 1898.	1 city bond.	1	3 1/2%	100,000.00
Amount uninvested.						\$520,500.00
						\$24.94

TABLE NO. 11.

PAY ROLL FOR YEAR INCLUDES SALARIES OF OFFICERS, ENGINEERS, FIREMEN, INSPECTORS AND LABORERS.			SALARIES OF ENGINEERS, FIREMEN AND KEEPERS AT THE VARIOUS STATIONS.						
MONTH.	No. of Men.	Total Amount o Pay Roll.	McCarron Lake Station.	Vadnais Lake Station.	Baldwin Lake Station.	West St. Paul Station.	Centerville Station.	Reservoir.	Total.
December, 1897.....	77	\$3,262.00	\$300.00	\$50.00	\$6.66	\$110.00	\$60.00	\$25.00	\$551.66
January, 1898.....	71	3,152.65	295.00	50.00	10.00	110.00	50.00	40.00	555.00
February, 1898.....	67	3,042.57	295.00	50.00	10.00	110.00	50.00	40.00	555.00
March, 1898.....	88	3,661.85	295.00	50.00	10.00	110.00	50.00	40.00	555.00
April, 1898.....	77	3,588.10	295.00	50.00	10.00	110.00	50.00	40.00	555.00
May, 1898.....	128	4,512.85	295.00	96.00	10.00	110.00	50.00	40.00	601.00
June, 1898.....	118	4,851.45	300.00	110.00	10.00	110.00	50.00	40.00	620.00
July, 1898.....	132	5,059.91	305.00	110.00	10.00	110.00	50.00	40.00	625.00
August, 1898.....	141	5,158.38	324.50	110.00	10.00	110.00	50.00	40.00	644.50
September, 1898.....	110	4,972.22	350.00	110.00	10.00	110.00	112.00	40.00	732.00
October, 1898.....	101	4,434.28	350.00	110.00	10.00	110.00	165.00	40.00	785.00
November, 1898.....	108	4,294.07	350.00	110.00	10.00	110.00	165.00	40.00	785.00
Totals	1,227	49,991.23	3,754.50	1,006.00	116.66	1320.00	902.00	465.00	7,564.16

TABLE NO. 12.

THE FOLLOWING TABLE SHOWS THE NUMBER OF APPLICATIONS
MADE FOR WATER SERVICE ANNUALLY FROM 1869 TO DATE.

YEAR.	High Service.	Low Service.	Total.
1869 .....	.....	34	
1870 .....	.....	321	
1871 .....	.....	250	
1872 .....	.....	164	
1873 .....	.....	131	
1874 .....	.....	153	
1875 .....	.....	95	
1876 .....	.....	85	
1877 .....	.....	67	
1878 .....	.....	50	
1879 .....	.....	180	
1880 .....	.....	167	
1881 .....	.....	164	
1882 .....	.....	264	
1883 .....	.....	361	
			2,426
1884	164	336	500
1885	644	365	1,009
1886	639	369	1,008
1887	747	325	1,072
1888	812	406	1,218
1889	1,327	491	1,818
1890	1,071	336	1,407
1891	811	264	1,075
1892	671	210	881
1893	474	151	625
1894	363	139	502
1895	390	311	701
1896	384	156	540
1897	332	98	430
1898	401	129	530
Totals	9,230	6,512	15,742

TABLE NO. 13.

PUMPING PLANTS—EXPENSE MAINTAINING THE FIVE (5) PUMPING
STATIONS AND RESERVOIR.

STATION.	Salaries.	Fuel.	Waste and Mach. Oil.	Supplies and Repairs	Kerosene Oil.	Total.
McCarron Lake.....	\$3,754.50	\$2,923.00	\$203.34	\$83.14	\$4.72	\$7,058.70
Baldwin Lake.....	116.68	56.00				172.68
Vadnais Lake.....	1,006.00	1,049.49	65.82	73.81	18.55	2,213.67
West St. Paul.....	1,320.00	355.97	1.69	40.76	9.00	1,727.42
Centerville	902.00	12.00	38.58	16.18	9.41	978.17
Reservoir	465.00					465.00
Totals	\$7,564.16	\$4,396.46	\$309.43	\$213.89	\$41.68	\$12,615.62

TABLE NO. 14.

METERS IN SERVICE JAN. 1, 1899.

	15	2,554	311	190	138	49	8	9	3,274
Totals									

TABLE NO. 15.

SHUT OFF AND TURNING ON WATER FROM JAN 1, 1898, TO JAN. 1, 1899.

	High Service.	Low Service.	Total.
Shut off for repairs	222	236	508
Shut off for non-payment	180	161	341
Shut off for vacant premises	520	398	927
Shut off for violation of rules. . . . .	.....	4	4
Totals	931	840	1,790
Turned on old services	1,010	853	1,863
Turned on new services	368	127	495
Turned on for builders. . . . .	.....	32	32
Totals	1,378	1,012	2,390

Total services shut off and turned on for year ending:

December 1, 1884	1,014	December 1, 1892	4,470
December 1, 1885	2,311	December 1, 1893	4,477
December 1, 1886	2,384	December 1, 1894	4,932
December 1, 1887	2,541	December 1, 1895	4,996
December 1, 1888	2,833	December 31, 1896	4,373
December 1, 1889	3,978	December 31, 1897	4,435
December 1, 1890	3,010	December 31, 1898	4,170
December 1, 1891	4,743		

TABLE NO. 16.

SHOWING THE DIFFERENT KINDS AND SIZES OF METERS BELONG-
ING TO THE CITY AND PRIVATE PARTIES, IN SERVICE AND ON
HAND, DEC. 31, 1908.

KIND OF METERS.	Size in inches.	PROPERTY OF CITY.			PRIVATE PROPERTY.			Grand Total of Meters in Service.	Grand Total of Meters in Shop.	Grand Total of all Meters.
		In Ser-vice.	At Work Shop.	Total.	In Ser-vice.	At Work Shop.	Total.			
Worthington improved.....	4						4	4		4
Worthington improved.....	3						4	4		4
Worthington improved.....	3	3					3	3		3
Worthington improved.....	1 1/2	38					38	38		38
Worthington improved.....	1	30					30	30		30
Worthington improved.....	3/4	113	1				114	114		114
Worthington improved.....	3/4	75					75	75		75
Worthington old style.....	3								3	3
Worthington old style.....	2	2					2	2		2
Worthington old style.....	1 1/2	9					9	9		9
Worthington old style.....	1	9					9	9	3	12
Worthington old style.....	3/4	16					16	16		16
Worthington old style.....	3/4	8					8	8		8
Union rotary.....	4							3		3
Union rotary.....	2								1	1
Union rotary.....	2							1		1
Union rotary.....	1 1/2						1	1		1
Union rotary.....	1							10	2	12
Union rotary.....	3/4							23		23
Union rotary.....	3/4							75	5	80
Union piston.....				1			1	1		1
Union piston.....				1			1	1		1
Columbia.....			1	6			6	5	1	6
Nash.....							1		1	1
Nash.....				2			2	2		2
Nash.....				11			11	12		12
Nash "A".....				1			1	1		1
Nash "A".....				14			14	13	2	15
Nash "AA".....				90			90	59	1	60
Crown.....				1			1	2		2
Crown.....								1		1
Crown.....							1	10		10
Crown.....								35		35
Crown.....								29	2	31
Crown.....								18		18
Crown.....							2	72	1	73
Crown.....				1					1	1
Crown "AA".....								3		3
Crown "AA".....				1				14	1	15
Crown "AA".....				17	6			534	17	551
Empire.....					1			1		1
Empire.....				2	10			6	2	10
Empire.....				1	35			34	1	35
Empire.....				2	40			47	2	49
Empire.....				19	21			19	2	21
Empire.....				14	14			14		14
Empire "A".....	1	2	1	3				2	1	3
Empire "A".....		4		4				4		4
Empire "A".....		6		6				6		6
Empire "AA".....		1		1				1		1
Empire "AA".....			1	1					1	1
Gem.....	4						1	1		1
Gem.....							1	1	1	2
Thomson.....								2		2
Thomson.....				5				5		5
Thomson.....				16				16		16
Thomson "B".....				1			1			1
Thomson "B".....	1 1/2	2		2				2		2
Thomson "B".....	1	5		5				5		5
Thomson "B".....		13		13				13		13
Thomson "B".....	3/4	46	2	51				49	2	51

TABLE NO. 16—Continued.

KIND OF METERS.	SUM			
Thomson "B"				
Lambert		1		1
Lambert		3		3
Lambert "A"		1		1
Lambert "A"		1		1
Hersey		2		2
Hersey		13	1	14
Hersey		24		24
Hersey		20	1	20
Hersey		38	3	41
Hersey		20	1	20
Hersey disc.		1		1
Hersey disc.		2		2
Hersey disc.		3		3
Frost		1		1
Sport			1	1
Trident		1		1
Trident		1		1
Trident		55	5	60
Westinghouse	1	1		1
Westinghouse	1	1		1
Westinghouse	5	4	1	5
Westinghouse	4	4		4
Pittsburg disc.	3	3		3
Pittsburg disc.	12	11	1	12
Pittsburg disc.	21	20	1	21
Pittsburg disc.	22	22		22
Pittsburg disc.	68	1,484	68	1,552
Niagara		1		1
Niagara		1		1
Totals	3,223	145	3,368	51
	4	53	3,274	149
				3,423

TABLE NO. 17.
EXPENSE FOR MAINTAINING PUMPING STATIONS AND RESERVOIR FOR YEARS 1891-2-3-4-5-6-7 AND 8, McCAR-
RON LAKE STATION.

YEAR.	Salaries.	Fuel.	Machine Oil and Waste.	Repairs and Supplies.	Kerosene Oil.	Total.	WATER PUMPED.		FUEL, COAL, ETC.		Daily Increase in Pumping, Gallons.
							Annually.	Daily.	Annually.	Daily.	
1891	\$3,540.00	\$4,702.12	\$213.86	\$230.06	\$38.50	\$5,725.14	1,106,034.60	3,030,232	2,134,000	5,845	871,000
1892	3,575.00	5,400.80	502.36	37.82	36.75	9,352.82	1,071,130,320	2,934,003	2,036,734	5,590	.....
1893	3,593.00	5,413.30	279.50	329.46	Electric	9,615.32	1,208,551,200	3,557,674	2,147,888	5,894	623,070
1894	3,703.50	5,012.85	237.00	351.12	5.20	9,313.66	1,300,813,600	3,882,110	2,345,731	6,427	320,000
1895	3,652.00	5,034.79	243.57	269.00	5.20	9,204.65	1,536,912,000	4,210,719	2,536,020	6,948	338,600
1896 (13 mos.)	3,747.00	5,963.64	292.40	305.74	.....	10,308.78	1,651,524,200	4,100,011	2,751,008	6,915	500,700
1897	3,600.00	3,898.07	237.45	101.68	.....	7,827.20	1,280,312,340	3,507,765	2,074,208	5,682	652,300
1898	3,754.50	2,923.00	203.34	83.14	4.72	7,068.70	1,456,108,200	3,089,501	2,205,128	5,992	482,301

*Increase.

BALDWIN LAKE STATION.

YEAR.	Salaries.	Fuel.	Machine Oil and Waste.	Repairs and Supplies.	Kerosene Oil.	Total.	WATER PUMPED.		FUEL, COAL, ETC.		Daily Increase in Pumping, Gallons.
							Annually.	Daily.	Annually.	Daily.	
1891	\$1,507.16	\$4,008.44	\$51.98	\$77.39	\$22.14	\$6,657.11	1,983,034,500	8,077,535	Coal 150,325 Wood 797%	.....	.....
1892	1,002.00	941.00	56.28	56.12	11.90	2,127.39	1,153,794,000	9,470,293	Wood 576	.....	.....
1893	1,145.00	778.42	45.18	303.90	10.35	2,343.60	1,104,158,600	9,210,623	Wood 461%	.....	.....
1894	1,245.00	1,182.05	49.80	251.63	10.30	2,739.44	1,449,300,000	9,082,400	Wood 600%	4 1/2	.....
1895	1,450.00	2,524.46	23.77	45.19	27.08	4,070.50	1,914,949,000	8,824,653	Wood 821	4	.....
1896 (13 mos.)	1,564.70	1,097.88	17.88	14.40	15.83	3,310.79	1,917,068,000	9,271,715	Wood 841%	4.3	.....
1897	35.00	.....	.....	.....	.....	35.00	.....	.....	.....	.....	.....
1898	116.00	56.00	.....	.....	.....	172.00	.....	.....	.....	.....	.....

TABLE NO. 18.
COMPARATIVE STATEMENT OF HOSE VIOLATIONS FOR 1894-5-6-7 AND 8.

VIOLATIONS.	1894.			1895.			1896.			1897.			1898.		
	High.	Low.	Total.	High.	Low.	Total.	High.	Low.	Total.	High.	Low.	Total.	High.	Low.	Total.
Hose, 1 violations.....	200	124	320	136	87	223	155	46	201	91	9	100	130	15	145
Hose, 2 violations.....	28	16	44	5	1	6	10	3	13	1	.....	1	5	.....	5
Hose, 3 violations.....	13	7	20	1	.....	1	1	1	2	2	.....	.....	.....	.....	.....
Hose, 4 violations.....	2	3	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hose, 5 violations.....	1	2	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hose, 7 violations.....	2	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reel, 6 to 9 p. m., 1 violation.....	185	50	235	34	.....	34	61	4	65	37	1	38	65	1	66
Reel, 6 to 9 p. m., 2 violations.....	22	14	36	6	.....	6	1	.....	1	2	.....	2	1	.....	1
Reel, 6 to 9 p. m., 3 violations.....	6	2	8	2	.....	2	1	.....	1	.....	.....	.....	.....	.....	.....
Reel, 6 to 9 p. m., 4 violations.....	2	1	3	2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reel, 6 to 9 p. m., 7 violations.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hose, all day, 1 violation.....	102	34	136	1	.....	1	40	3	43	28	9	35	68	.....	68
Hose, all day, 2 violations.....	23	9	32	1	.....	1	.....	.....	.....	3	.....	3	.....	.....	.....
Hose, all day, 3 violations.....	2	4	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hose, all day, 4 violations.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals	648	274	922	188	88	276	200	57	326	163	19	182	209	16	285

NUMBER OF PERMITS ISSUED ANNUALLY TO PLUMBERS SINCE 1884:

1884.....	718	1888.....	.....	1,640	1896.....	1,173
1885.....	1,454	1889.....	.....	1,562	1897.....	1,060
1886.....	1,497	1890.....	.....	1,045	1898.....	1,104
1887.....	1,610	1891.....	.....	1,770	.....	.....

PUMPING STATIONS AND RESERVOIR.—Continued.

VADNAIS LAKE STATION.

YEAR.	Salaries.	Fuel.	Machine Oil and Waste.	Repairs and Supplies.	Kerosene Oil.	Total.	WATER PUMPED.		FUEL, COAL, ETC.	
							Annually.	Daily.	Annually.	Daily.
1891.....	\$1,100.00	\$1,081.68	\$50.75	\$197.12	\$6.36	\$2,435.91	207,750,000	.....	246,800	.....
1892.....	1,020.00	1,905.25	73.71	102.19	25.99	3,127.05	.....	.....	.....	.....
1893.....	600.00	.....	.....	21.35	.....	621.35	.....	.....	.....	.....
1894.....	912.50	1,508.99	21.06	210.75	20.00	2,679.90	337,160,000	.....	624,387	.....
1895.....	848.33	1,105.00	47.50	31.58	11.64	2,044.05	237,043,000	.....	550,000	.....
1896 (13 months).....	1,147.48	1,618.77	44.22	38.76	32.52	2,881.75	938,011,850	2,364,282	612,614	.....
1897.....	754.00	479.83	6.59	46.92	9.81	1,297.15	290,299,350	795,341	195,930	.....
1898.....	1,006.00	1,049.40	65.82	73.81	18.55	2,213.67	924,705,000	4,549,541	589,300	.....

WEST ST. PAUL STATION.

1893.....	\$1,237.75	\$589.63	\$29.72	\$23.50	\$15.10	\$1,895.70	10,015,722	27,440	209,043	571
1894.....	1,320.00	328.90	2.88	28.83	14.20	1,694.87	9,123,480	24,904	199,220	483
1895.....	1,320.00	290.50	5.27	20.47	9.08	1,645.32	10,520,040	28,848	174,600	479
1896 (13 months).....	1,430.00	529.88	4.58	33.37	12.00	2,009.83	13,497,120	33,968	212,200	535
1897.....	1,320.00	361.22	5.36	42.86	11.60	1,741.04	16,018,200	43,886	229,800	629
1898.....	1,320.00	355.97	1.00	40.76	9.00	1,727.42	22,668,680	61,654	269,200	742

CENTERVILLE STATION.

1897.....	\$943.50	\$1,764.85	\$35.92	\$2.59	\$9.54	\$2,656.39	.....	.....	.....	.....
1898.....	902.00	12.00	38.58	16.18	9.41	978.17	596,535,200	14,029,638	100%	4 cords.

RESERVOIR.

Year.	Salaries.	Year.	Salaries.
1891.....	\$405.00	1895.....	\$405.00
1892.....	405.00	1896 (13 months).....	480.00
1893.....	405.00	1897.....	405.00
1894.....	405.00	1898.....	465.00

TABLE NO. 20.

STATEMENT SHOWING NUMBER OF METERS, CONSUMPTION OF WATER, AMOUNTS RECEIVED FOR WATER AND METER RENTS, AND AVERAGE RATE PER MONTH.

MONTH.	Number of Meters.	Consumption, Cubic Feet.	Amounts Received for Water.	Ave. Rate per 100 Cubic Feet.	
1896.					
January	1,158	5,970,003	\$4,824.93	\$234.00	.06061
February	1,164	6,238,792	5,022.64	235.00	.06063
March ..	1,224	6,167,896	5,000.19	245.42	.06066
April ..	1,241	6,453,270	5,212.06	249.48	.06076
May	1,285	6,274,503	5,164.62	255.48	.06231
June	1,304	6,806,003	5,587.64	258.61	.0626
July	1,378	6,523,906	5,387.94	274.81	.06268
August	1,415	6,801,023	5,596.42	274.80	.06228
September	1,489	7,892,066	6,306.34	289.77	.07989
October	1,515	6,518,949	5,324.12	292.80	.06167
November ..	1,526	6,541,052	5,309.11	290.25	.0611
December ..	1,546	5,985,142	4,886.44	291.06	.06233
Totals		78,147,427	\$63,621.47	\$3,192.07	.06171
1897					
January	1,594	6,249,091	\$5,103.00	\$299.19	.061
February	1,601	5,836,410	4,821.99	298.78	.0639
March	1,719	6,123,406	5,011.21	315.12	.0616
April ..	1,758	6,065,240	5,072.85	322.14	.0632
May ..	1,821	5,947,842	4,274.06	332.49	.0718
June ..	1,867	6,208,849	4,464.09	339.41	.0708
July ..	2,000	6,320,138	4,569.53	360.46	.0721
August ..	2,059	6,671,269	4,738.88	366.97	.071
September ..	2,183	6,616,801	4,840.61	389.06	.07316
October ..	2,262	6,542,878	4,764.48	390.72	.0725
November ..	2,290	6,394,309	4,620.55	399.97	.07226
December ..	2,294	6,296,372	4,574.95	402.38	.0726
Totals ..		75,392,211	\$56,655.72	\$4,225.05	.0754
1898.					
January ..	2,380	6,182,474	\$4,507.74	\$410.28	.0729
February ..	2,389	6,152,653	4,502.29	412.87	.0731
March ..	2,568	6,583,278	4,769.19	442.77	.0724
April ..	2,619	6,313,093	4,721.24	461.35	.0747
May ..	2,672	6,893,109	5,040.66	462.96	.0731
June ..	2,750	7,404,121	5,391.63	475.33	.0729
July ..	2,808	7,320,745	5,500.73	495.65	.0751
August ..	2,896	7,895,577	5,703.18	507.11	.0733
September ..	3,196	8,366,497	6,171.40	538.32	.0737
October ..	3,320	7,616,828	5,591.12	562.18	.0734
November ..	3,346	7,094,539	5,545.89	563.80	.0723
December ..	3,355	7,546,785	5,472.34	568.94	.0725
Totals ..		85,932,699	\$63,607.61	\$5,596.42	.0732

LIST OF VOUCHERS.—Continued.

FEBRUARY, 1898.

No. of Voucher.	NAME.	CLAIM.	Amount.
9321	C. L. Horst, city treasurer.....	Interest due Feb. 1, 1898.....	\$3,750.00
9322	Hennessey & Cox.....	Est. No. 6 and final, engine house..	50.00
9323	D. F. De Wolf.....	Hay	19.65
9324	Scribner & Libby Co.....	Balance on roofing storage shed....	10.00
9325	Pioneer Press Co.....	Blank books and job printing.....	15.70
9326	The Dispatch Printing Co.....	Advertising	6.00
9327	H. M. Smyth Printing Co.....	Job printing.....	23.00
9328	The Globe Co.....	Advertising	2.25
9329	N. W. Engineering Co.....	Electric lamps and wire.....	13.80
9330	Jameson, Hevener & Co.....	Oats	50.07
9331	Viscosity Oil Co.....	Engine oil.....	11.55
9332	Craig Oil Co.....	Engine oil.....	8.90
9333	Minnesota and Kettle River Sandstone Co.	Est. No. 1, stone for foundation, McCarron Lake.....	554.56
9334	C. L. Horst, city treasurer.....	Pay roll for January, 1898.....	3,152.65
9335	American Hoist and Derrick Co.....	Bronze casting for boilerplate.....	9.02
9336	De Coster & Clark Co.....	Desk for office.....	28.00
9337	George J. Mitsch Drug Co.....	Meal and paint.....	5.27
9338	N. W. Fuel Co.....	Fuel, Est. No. 5.....	82.58
9339	P. N. Lindquist.....	Horseshoeing	5.00
9340	Adam Decker & Co.....	One gross screws.....	.43
9341	Estate of James Giffillan.....	Rent of storage lot.....	25.00
9342	W. W. Benjamin.....	Livery to pump house.....	25.00
9343	Mitsch Wagon and Carriage Co.....	Blacksmithing	4.70
9344	Michael Maurus	Blacksmithing	4.25
9345	Samuel Carmen Printing Co.....	Job printing.....	5.50
9346	Greiner & Co.....	Brick	152.00
9347	D. D. Smith, agent, the Barney Bldg.	Light for office.....	7.50
9348	John Martin Lumber Co.....	Lumber	7.80
9349	Boeringer & Son.....	Drawing ink.....	1.00
9350	S. C. Smith.....	Livery to Centerville on account lawsuit	3.00
9351	Joseph M. Forcier.....	Board and stabling.....	2.20
9352	C. A. Daniel, proprietor, Quaker City Rubber Co.....	Rubber packing.....	11.25
9353	Thomson Meter Co.....	Meters	69.20
9354	C. L. Horst, city treasurer.....	Interest on bonds to March 1, 1898.	6,750.00
9355	H. C. Boyeson Stationery Co.....	Stationery	6.95
9356	St. Paul Furniture Co.....	Strip for book case.....	.50
9357	T. L. Blood & Co.....	Paint material.....	11.10
9358	Hennessey & Cox.....	Repairing asphalt.....	74.25
9359	D. L. Bell.....	Portland cement.....	138.00
9360	Daniel Cashill & Co.....	Horseshoeing	4.00
9361	Brown, Treacy & Co.....	Stationery	8.87
9362	Henry Wedelstaedt.....	Stationery	9.57
9363	Foley Bros. & Kelly Mercantile Co..	Oil and candles.....	11.88
9364	Robinson, Cary & Co.....	Brass pipe, etc.....	1.60
9365	Ogden, Merrill & Greer.....	Dusters .....	.83
9366	Fairbanks, Morse & Co.....	Estimate No. 6, laying mains.....	104.22
9367	H. P. Rugg.....	White waste.....	18.84
9368	Moorhead & Horrigan.....	Livery	2.00
9369	The Western Supply Co.....	Pipe fittings.....	1.17
9370	Rudolph Miller.....	Hauling wood to Baldwin lake.....	6.00
9371	Farwell, Ozmun, Kirk & Co.....	Tar paper.....	2.50
9372	Chas. Friend & Son.....	Harness dressing.....	.85
9373	The Crane & Ordway Co.....	Brass fittings, etc.....	30.81
9374	The Dispatch Printing Co.....	Advertising .....	.96
9375	Chas. Weinhausen Co.....	Strawboard tubes.....	1.25
9376	John Caulfield, secretary.....	Cash advanced per voucher.....	100.90
9377	James Shlely.....	Hauling brick, etc.....	32.75
	Total		\$15,431.63

LIST OF VOUCHERS.—Continued.

APRIL, 1898.

No. of Voucher.	NAME.	CLAIM.	Amount.
9436	Chas. D. Lynch.....	Automatic drip valves.....	\$272.81
9437	Capitol Printing Co.....	5,000 force reports.....	7.50
9438	Bingham & Taylor.....	Extension tops for stop boxes.....	141.25
9439	Fairbanks, Morse & Co.....	Est. No. 7, pipe laying.....	325.20
9440	Scribner & Libby Co.....	Making bolts, etc.....	9.50
9441	Gribben Lumber Co.....	Lumber for meter boxes.....	17.63
9442	N. W. Shot and Lead Works.....	Two-inch lead pipe.....	7.48
9443	Minnesota Type and Foundry Co.....	Repairing numbering machine.....	1.00
9444	C. Neuman.....	Lunches for trips to view lakes, etc.....	15.50
9445	T. L. Blood.....	Mineral paint.....	.65
9446	Jos. N. Forcier.....	Centerville, board and stabling.....	2.75
9447	Pittsburgh Meter Co.....	Est. No. 1, meters.....	1,957.20
9448	C. L. Horst, city treasurer.....	Pay roll, March, 1898.....	3,061.65
9449	C. L. Horst, city treasurer.....	Interest due May 1, 1898.....	8,750.00
9450	Pioneer Press Co.....	Est. No. 1, and final, printing annual report.....	296.58
9451	Pioneer Press Co.....	Job printing.....	58.35
9452	Prendergast Bros.....	Patent smoke stack.....	7.50
9453	Mitsch Wagon and Carriage Co.....	Blacksmithing.....	61.25
9454	The Dispatch Printing Co.....	Advertising for lead pipe.....	1.70
9455	H. P. Rugg & Co.....	Tools.....	1.05
9456	Thos. Brennan Lumber Co.....	Lumber.....	9.25
9457	J. G. Duggan.....	Sharpening tools, etc.....	4.00
9458	P. N. Lindquist.....	Horseshoeing.....	5.00
9459	D. Cashill & Co.....	Horseshoeing.....	5.00
9460	A. Decker & Co.....	Screws.....	.50
9461	N. W. Shot and Lead Works.....	Lead pipe.....	9.66
9462	Viscosity Oil Co.....	Cylinder oil.....	21.84
9463	H. C. Boyeson Stationery Co.....	Stationery.....	4.65
9464	Jameson, Hevener & Co.....	Hay.....	8.53
9465	The Crane & Ordway Co.....	Pipe fittings.....	6.41
9466	H. E. Wedelstaedt & Co.....	Stationery.....	7.56
9467	The Globe Co.....	Advertising.....	3.00
9468	H. M. Smyth Printing Co.....	Job printing.....	4.50
9469	Brown, Treacy & Co.....	Stationery, etc.....	21.78
9470	Farwell, Ozmun, Kirk & Co.....	Tools, locks, etc.....	14.00
9471	D. L. Bell.....	Mankato cement.....	33.00
9472	Foley Bros. & Kelly Mercantile Co..	Candles, matches, etc.....	8.20
9473	Robinson & Cary Co.....	Tools, etc.....	62.50
9474	N. W. Fuel Co.....	Est. No. 9, fuel.....	46.33
9475	Allen & Co.....	Livery.....	5.00
9476	Gribben Lumber Co.....	Lumber.....	10.82
9477	Geo. J. Mitsch Drug Co.....	Supplies.....	4.30
9478	The Western Supply Co.....	Pipe fittings.....	1.20
9479	T. L. Blood Co.....	Lead and oil.....	1.00
9480	John Kenny.....	Angle iron.....	.75
9481	Cornplanter Oil Co.....	Gasoline.....	1.06
9482	S. Paul Stone Co.....	Tiling.....	1.02
9483	Illinois Malleable Iron Co.....	Stop box covers.....	32.50
9484	Paul Bork.....	Repairing chairs.....	1.35
9485	H. G. Neal.....	Repairing awning.....	1.00
9486	Moorhead & Horrigan.....	Carriage to Baldwin Lake.....	6.00
9487	Estate of Jas. Gilfillan.....	Rent of storage lot.....	25.00
9488	D. D. Smith, agent, the Barney Bldg.	Electric light for office.....	7.50
9489	John Caulfield, secretary.....	Bills paid per voucher.....	68.51
9490	John Kenny.....	Est. No. 1 and final, boiler.....	1,223.00
9491	Pittsburgh Meter Co.....	Est. No. 2, meters.....	800.00
9492	Hersey Manufacturing Co.....	Meter fittings.....	32.15
9493	W. K. Sharood.....	Horse for department use.....	180.00
9494	S. C. Smith.....	Livery.....	12.00
9495	A. O. Powell.....	Expert services, Wenzel vs. Board.	55.00
9496	Tracy Lyon.....	Expert services, Wenzel vs. Board.	55.00
9497	F. W. Coppellan.....	Expert services, Wenzel vs. Board.	55.00
9498	The Western Supply.....	Est. No. 1 and final, lead pipe and tin.....	1,754.68
9499	Pioneer Press Co.....	Job printing.....	68.75
9500	Tierney & Co.....	Bran.....	.68
9501	The Western Supply Co.....	Pipe fittings.....	69.80
9502	H. A. Muckle Manufacturing Co.....	Buggy for department use.....	105.00
9503	Anna Sweeney.....	Frontage tax refunded.....	40.32
9504	G. S. Heron.....	Frontage tax refunded.....	16.03
Total			\$20,457.03

LIST OF VOUCHERS.—*Continued.*

JUNE, 1908.

No. of Voucher.	NAME.	CLAIM.	Amount.
9568	The Western Supply Co.....	Est. No. 1, brass goods.....	\$255.05
9569	De Coster & Clark.....	Office chair.....	4.50
9570	N. W. Stamp Works.....	Rubber stamps.....	.30
9571	Scribner-Libby Co.....	Sharpening lawn mower.....	.75
9572	Griggs Bros.....	Oats and burlaps.....	74.30
9573	Peter Johnson.....	Gravel and sand for paving yard..	17.00
9574	Fielding & Shepley.....	Paving, cement, etc., for yard....	41.30
9575	Pioneer Press Co.....	Meter registers.....	62.50
9576	Wm. H. Ulmer.....	Coping stone, yard.....	22.75
9577	The Edward P. Allis Co.....	Steel plates for 6-million engine ..	14.00
9578	Dearborn Drug and Chemical Works.	Cylinder oil.....	23.40
9579	Viscosity Oil Co.....	One barrel viscosity oil.....	21.84
9580	Maendler Bros.....	Steel wire broom.....	.75
9581	John Kenny.....	Boiler steel.....	2.25
9582	Lanpher, Finch & Skinner.....	Overcharge 4-inch gate.....	8.00
9583	Allen & Co.....	Livery	10.00
9584	Bingham & Taylor.....	Gate boxes.....	82.76
9585	South Park Foundry and Machine Co.	Est. No. 3, specials.....	149.46
9586	South Park Foundry and Machine Co.	Sleeve bolts, etc.....	7.97
9587	Portland Stone Co.....	Cement tiling, McCarron Lake.....	127.35
9588	C. L. Horst, city treasurer.....	Pay roll for May, 1908.....	4,512.85
9589	Hennessey & Cox.....	Est. No. 7 and final.....	1,346.25
9590	T. L. Blood & Co.....	Asphaltum, etc.....	3.80
9591	Dispatch Printing Co.....	Advertising	5.61
9592	Gribben Lumber Co.....	Lumber	17.63
9593	Estate of Jas. Giffillan.....	Rent of storage lot.....	25.00
9594	John Martin Lumber Co.....	Lumber	177.50
9595	J. G. Duggan.....	Sharpening tools.....	2.05
9596	Moorhead & Horrigan.....	Livery	8.00
9597	St. Paul Foundry Co	Beams, top plates, etc., McCarron Lake	103.65
9598	H. P. Rugg & Co.....	Waste, etc.....	21.74
9599	Schroeder Bros.....	Tin gutters and repairs.....	4.24
9600	Thos. Brennan Lumber Co.....	Lumber	21.43
9601	Fairbanks, Morse & Co.....	Est. No. 8 and final pipe laying....	21.76
9602	Brown, Treacy & Co.....	Stationery	5.28
9603	St. Paul Fire and Marine Ins. Co....	Insurance on residence at reservoir	14.40
9604	W. H. Viall.....	Hauling coal to Vadnais Lake station	27.63
9605	Alfred Gustafson.....	Damages	25.00
9606	Mitsch Wagon and Carriage Co.....	Repairing buggy.....	10.80
9607	Foley Bros. & Kelly Mercantile Co...	Matches	1.00
9608	Ogden, Merrill & Greer	Duster .....	.35
9609	Nicols & Dean.....	Iron and bolts.....	4.33
9610	Chas. Friend & Son.....	Harness fittings.....	6.40
9611	P. N. Lindquist.....	Horseshoeing	4.00
9612	The George J. Mitsch Drug Co.....	Supplies	10.48
9613	Paul Bork.....	Repairing cushion.....	1.50
9614	Jacob Koch.....	Horseshoeing	2.00
9615	The Samuel Carmen Printing Co.....	Job printing.....	7.50
9616	The Board of Fire Commissioners.....	Old hose.....	64.40
9617	H. E. Wedelstaedt.....	Stationery	8.48
9618	H. C. Boyeson Stationery Co.....	Stationery	5.85
9619	Adam Decker & Co.....	Hardware	10.78
9620	Joseph N. Forcier.....	Board and supplies.....	1.95
9621	Cornplanter Oil Co.....	Gasoline	1.75
9622	Rudolph Miller.....	Hay, Baldwin Lake.....	4.00
9623	Scribner-Libby Co.....	Wrench for 6-million pump.....	2.32
9624	Daniel Cashill.....	Horseshoeing	4.50
9625	M. F. Brennan.....	Livery	5.00
9626	Crane & Ordway.....	Pipe fittings.....	47.77
9627	St. Paul Co-operative Painting Co....	Whitewashing office and pump house	36.50
9628	J. H. Schurmeler Wagon and Carriage Co.....	Iron rods for force main.....	21.00
9629	Farwell, Ozmun, Kirk & Co.....	Tools, etc.....	98.24
9630	Robinson & Cary Co.....	Pipe fittings, etc.....	15.10

LIST OF VOUCHERS.—*Continued.*JUNE, 1898.—*Continued.*

No. of Voucher.	NAME.	CLAIM.	Amount.
9631	Ella S. Dent.....	Erroneous frontage tax.....	4.50
9632	S. C. Smith.....	Livery	3.00
9633	Martin Feist.....	Lunch for men cleaning conduit....	3.50
9634	P. H. Thornton.....	Est. No. 1, pipe laying.....	434.16
9635	C. L. Horst, city treasurer.....	For sinking fund account.....	25,000.00
9636	Pittsburgh Meter Co.....	Est. No. 3, meters.....	800.00
9637	Craig Oil Co.....	Oil	20.68
9638	N. W. Fuel Co.....	Est. No. 9, fuel.	506.03
9639	H. W. Phillips.....	Legal expenses, Wenzel vs Board.	13.95
9640	Union Brass Metal Manufacturing Co.	Top nuts street sprinkling hydrants	4.80
9641	C. L. Horst, city treasurer.....	Interest due July 1, 1898.....	5,850.00
	Total		\$40,287.23

LIST OF VOUCHERS.—Continued.

JULY, 1920.

		98.00
Wing	Sell vs.	
Lumber Co		750.00
Martin Lumber Co... ..		315.80
Park Foundry and Machine Co		562.48
Wedelstaedt & Co.....		230.00
Stamp Works		12.31
Benedict.. .	Typewriter supplies.....	.75
Co	Stationery	4.25
City Brick Co	Stationery .....	.31
& Co	Pressed brick, McCarron Lake....	12.21
	Livery	72.00
	Feed	5.00
	Supplies	19.37
	Relaying pavement	19.93
	Mercury	11.54
	Lumber	1.79
Andquist,		17.63
& Dean.....		2.00
Rugg & Co... ..		1.89
Iron. & Kelly Mercantile Co... ..		1.63
on & C		4.30
Co.	etc	50.18
		3.91
y Co.		4.00
Co		1.80
	neall.....	2.00
	les....	29.59
	Pleasant Lake con-	
		5.00
		12.00
		.35
Farwell, Ozmun, Kirk & Co		43.19
Crane & Ordway Co.. ..	fittings.....	21.88
Smith & Farwell Co. . .	etc., office,	7.00
Union Brass and Metal Manuf'g Co..	meter books.....	4.80
Co... ..		136.32
		2.00
Co		4.38
ul Cartage Co	ravage.....	155.37
ipe Co	ast iron pipe.	1,618.84
	pe laying.	499.68
		6.00
	Aug 1, 1896.	3,750.00
Total		\$14,786.37

LIST OF VOUCHERS.—Continued.

AUGUST, 1898.—Continued.

No. of Voucher.	NAME.	CLAIM.	Amount.
9776	N. W. Engineering Co.....	Electric wire and lamps.....	29.80
9777	Ogden, Merrill & Greer.....	Lantern fixtures.....	2.53
9778	Allen & Co.....	Livery.....	4.00
9779	F. W. Luley & Son.....	Tallow.....	1.00
9780	Adam Decker & Co.....	Screws.....	.88
9781	Boeringer & Son.....	Repairing levels.....	.35
9782	Fred Swanson.....	Painting pumps.....	18.00
9783	The Globe Co.....	Advertising.....	3.00
9784	Andrew Johnson.....	Overflow privilege reservoir.....	25.00
9785	The Barney Building, M. M. Steffy, agent.....	Electric light for office.....	15.00
9786	Chas. H. Klein.....	Est. No. 1, brick.....	800.76
9787	Martin Feist.....	Lunch for men cleaning conduit.....	3.50
9788	Thos. Brennan Lumber Co.....	Est. No. 1, lumber.....	700.47
9789	The Western Supply Co.....	Jute packing, etc.....	11.85
9790	N. W. Fuel Co.....	Est. No. 11, fuel.....	919.58
9791	W. H. Viall.....	Hauling coal, Vadnais.....	16.96
9792	Estate of Jas. Gillilan.....	Rent of storage lot.....	25.00
9793	Martinson & Sundberg.....	Brick conduit, est. No. 1, Pleasant Lake.....	270.13
9794	P. H. Thornton.....	Est. No. 3, pipe laying.....	649.37
9795	South Park Foundry and Machine Co.....	Est. No. 4, valves.....	352.25
9796	South Park Foundry and Machine Co.....	Est. No. 5, special castings.....	75.85
9797	John Fitzgerald, superintendent of workhouse.....	Two dozen brooms.....	4.00
9798	St. Paul Rubber Co.....	Hip rubber boots.....	14.95
9799	The Breen Stone Co.....	Cut stone for gate house, Pleasant Lake.....	121.00
9800	St. Paul Cartage Co.....	Est. No. 2, drayage.....	125.75
9801	J. H. Schurmeier Wagon and Cartage Co.....	Sharpening tools.....	1.56
9802	E. A. Boyd.....	Hauling piles to Pleasant Lake.....	25.53
9803	Jas. Shiely.....	Hauling rock to Pleasant Lake.....	200.00
9804	Gribben Lumber Co.....	Doors, windows, frames.....	175.00
9805	A. K. Barnum & J. B. Hewitt, executors.....	Refunded frontage tax.....	67.53
9806	G. M. Wing.....	Transcribing evidence, Wenzel vs. Board.....	177.72
9807	Gribben Lumber Co.....	Lumber for meter boxes.....	17.63
9808	Chas. Klein.....	Est. No. 2, brick.....	68.25
9809	N. W. Lime Co.....	Est. No. 1, Portland cement.....	166.50
9810	P. R. L. Hardenbergh & Co.....	Leather for meter washers.....	3.30
9811	South Park Foundry and Machine Co.....	Est. No. 6, special castings.....	16.20
9812	Portland Stone Co.....	Cement tile vestibule, McCarron.....	15.95
9813	St. Paul Sash, Door and Lumber Co.....	Boxes for fire hydrants.....	7.50
9814	Francis P. Corning, J. W. White, attorney.....	Frontage tax refunded.....	7.50
9815	De Cou & Co.....	Wire screen railing for pump houses.....	29.95
9816	N. W. Stamp Works.....	Rubber stamps.....	3.90
9817	Cornplanter Oil Co.....	Oil and Gasoline.....	13.97
9818	The Samuel Carmen Printing Co.....	Printing 1,000 postals, etc.....	5.50
Total.....			\$45,559.33

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LIST OF VOUCHERS.—Continued.

OCTOBER, 1898.

No. of voucher.	Name	CLAIM	Amount.
	urer.....	eptember, 1898.....	\$4,972.22
		m, Wenzel et al. vs.	29.50
			99.28
			18.89
			98
			1,600.00
	Co.....		21.20
		Lake.....	21.06
		Lake.....	11.50
			5.57
	nd Machine Co.	re repaired.....	17.00
	nd Machine Co.	ocial castings.....	25.52
	Lead Works..	strong lead pipe....	53.24
		ment.....	18.48
		aded lime.....	90
			19.84
		ge lot.....	25.60
		dnais Lake.....	4.80
			21.84
		ushes.....	8.50
			1.90
		abling.....	21.39
			10.00
	l Manuf'g Co..		16.10
			10.00
		ment.....	107.35
			5.79
	r Co.....	mber.....	159.08
		horse and buggy..	10.00
			2.00
			.25
			7.00
			2.86
	rinting Co.....		7.25
	Co.....		4.11
	Co.....		3.25
	Co.....	eto.....	23.62
			2.00
		waste rocks.....	40.90
			38.70
	enedict.....		4.60
			2.43
	and Car-		
		ols.....	2.34
			16.53
	Co.....		20.03
	& Co.....		4.07
	Mercantile Co..		4.10
			.38
			.92
			9.68
			.48
			24.19
			10.50
			7.17
		1, 1898.....	8,750.00
		o Vadnais Lake.....	17.53
		ipe laying.....	497.65
		ayage.....	22.92
		nduit, Pleasant Lake.	89.25
		re.....	2.70
			8.44
		pal, etc.....	947.84
		vouchers attached.....	45.50
		l.....	3.34
		ement.....	183.06
		id final.....	444.07
		ater works convention	97.41
	Total.....		\$18,638.10

9940 The Crane & Ordway Co
 9941 John Caulfield.

LIST OF VOUCHERS.—*Continued.*NOVEMBER, 1898.—*Continued.*

No. of Voucher	NAME.	CLAIM.	Amount.
10006	Leon F. Dupree.....	Personal services.....	10.00
10007	Gribben Lumber Co.....	Est. No. 1, final.....	202.01
10008	W. H. Viall.....	To hauling coal, Vadnais Lake....	22.10
10009	N. W. Fuel Co.....	Est. No. 14 and final.....	211.48
10010	South Park Foundry and Machine Co.	Est. No. 9, specials.....	30.55
10011	South Park Foundry and Machine Co.	Manhole covers.....	16.50
10012	Frank C. Scott.....	Land for right of way, Centerville Lake	100.00
10013	South Park Foundry and Machine Co.	Hydrant caps.....	46.25
10014	D. F. Reese, clerk supreme court....	Clerks' fees.....	7.50
10015	The Schwartz Decorating Co.....	Painting gate house, Pleasant Lake	28.00
10016	Hennessey & Cox.....	Relaying pavement.....	152.48
10017	Martin Feist.....	Board of men testing pumps.....	71.70
10018	D. F. De Wolf.....	Hay	23.22
10019	The Ludlow Valve Manufacturing Co.	One 30-inch valve.....	185.00
10020	Robt. W. Hunt & Co.....	Est. No. 3 and final, testing pumps	300.00
	Total .....	.....	\$18,134.77

SUPERINTENDENT'S REPORT.

ST. PAUL, MINN., Jan. 1, 1899.

To the Board of Water Commissioners,

GENTLEMEN: I herewith submit my annual report for work done, by and under your direction, for the year 1898.

The accompanying tables, from No. 1 to No. 18, inclusive, show in detail the amount and character of work done, and other statistical matter relating to mains, hydrants, valves, etc.

WATER MAINS LAID DURING THE YEAR 1898.

10,069 lineal feet of water pipe laid on high service.

1,366 lineal feet of water pipe laid on high service, West Side.

2,135 lineal feet of water pipe laid on low service.

13,570 total lineal feet, or 2.57 miles, of new mains.

712 lineal feet of mains relaid.

14,282 lineal feet. Making a total of new mains laid and old mains relaid of 2.7 miles.

The number of fire hydrants placed during the year.....	19
The number of valves placed during the year.....	26
The number of street sprinkling stand pipes placed during the year.	3
Service connections put in.....	530
New meters placed during the year.....	1,055
Automatic fire extinguishers placed during the year.....	4

FIRE HYDRANTS.

There were nineteen (19) fire hydrants placed during the year, making a total of twenty-two hundred and sixty-eight (2268) that are now in service.

FIRE HYDRANT REPAIRS.

There were six hundred and thirty-six (636) hydrants upon which a repair of some kind was done during the year. In referring to the number of hydrants repaired, a "repair" is considered whenever it is found

SERVICE PIPE CONNECTIONS.

There have been five hundred and thirty (530) service pipe connections put in during the year, making a total up to date of 15,742. The repairs on service due to leaks has been comparatively small, there having been only fifty-one (51) during the year. There were five hundred twenty-four (524) stop boxes that required attention and repairs; the work consisted of replacing broken parts, raising, lowering and changing the location of some, by reason of grading and boulevarding streets.

TEMPORARY MAINS.

There were two thousand and twenty-one (2,021) lineal feet of temporary mains laid during the year, making a total up to date in service of 11,341 lineal feet, ranging in size from three-fourths-inch to two-inch. These mains are abandoned whenever the permanent pipes are laid on the streets.

MAINS RELAID.

During the year the old sixteen-inch cement pipe on Locust street, between Eighth and Tenth streets, was removed and cast iron pipe substituted. There still remains in the city cement water mains in use which were included in the original purchase. The amount and location are as follows:

	Four-inch.	Six-inch.	Sixteen-inch.
Broadway, from Ninth street west to Grove street .....	.....	1,000 feet	.....
Canada street, from Ninth to Spruce street .....	.....	700 feet	.....
Canada street, from Norris to Grove...	.....	175 feet	.....
Spruce street, from Pine to Broadway..	200 feet	.....	.....
Pine street, from Van Slyke court to Spruce street	200 feet	.....	.....
Monroe place, from Grove to Woodward	250 feet	.....	.....
Lake Phalen main north of Fauquier street .....	.....	.....	5,400 feet
Total	650 feet	1,875 feet	5,400 feet

I would recommend that the four-inch and six-inch mains be replaced as soon as practicable. The six-inch main on Broadway will have to be laid this year, as the street is going to be paved. The six (6) inch main on Summit avenue, between Wabasha and St. Peter streets, was lowered to the standard depth just previous to the street being paved. This work was done by days' labor at a cost of twenty-nine cents per lineal foot.

CANALS.

Wilkinson Lake Canal—As per order of the Board dated June 27, 1898, there has been constructed one thousand lineal feet of wooden flume, being a continuation of the one that was built in 1897, along the west shore of the lake. This flume is seven by four feet, inside dimensions, made of dressed and matched lumber, and was built at a cost of ten hundred thirty-nine dollars and forty-seven cents (\$1039.47), being about one dollar and four cents (\$1.04) per lineal foot. Work was completed Aug. 11, 1898.

Peltier and Centerville Lake Canal—On Oct. 3, 1898, the Board ordered this canal to be excavated between the lakes; also, on Nov. 18, 1898, they ordered the right of way to be fenced. The total cost of this improvement was three hundred and seventy-four dollars and thirty seven cents (\$374.37), reported in detail to the Board Dec. 23, 1898. Work was completed and water turned into Centerville lake from Peltier lake on November seventeenth (17th), 1898.

The canal between Vadnais and Sucker lakes had been filled up to such an extent that the water was held back in Sucker lake, a foot or so above its proper height. The canal was lowered and the sides trimmed up wherever required. In connection with this matter, I would say that the bottom of stone arch culvert under the county road opposite G. Moosbrugger's property should be lowered about one foot, as it acts as a dam to the water coming from Sucker lake, and I recommend that it be done at once. The approximate cost will be about one hundred dollars (\$100).

PLEASANT LAKE IMPROVEMENT.

As per your order of May 27, 1898, I was authorized to make this improvement by doing the work by day labor. This improvement consists of the following work: An open canal, extending from Sucker lake to a point 2,054 feet north to Pleasant lake. It is eight and ten feet in width at the bottom, with the usual slopes, requiring the handling of 2,100 cubic yards of excavation; 1,213 lineal feet of brick and concrete conduit with a timber foundation; a brick gate house, thirty-one by twenty-one feet; 469 lineal feet of thirty-six-inch cast iron pipe for an intake pipe out into Pleasant lake.

The estimated cost of this improvement was ninety-four hun-

dred dollars	\$9,400.00
By work done which was not included in the approximate estimate, by reason of the thirty-six-inch intake being extended 169 feet further out into the lake, and the putting of reserve gate on intake; also, other miscellaneous work, in all amounting to	1,767.91
Total corrected estimate would have been.....	<u>\$11,167.91</u>

The actual cost of the work was as follows:

The canal	\$517.48
Brick conduit	4,258.36
Gate house	2,682.32
Intake pipe	3,769.03
<hr/>	
Total	\$11,227.19
Actual cost of work in excess of corrected estimate.....	\$109.28

It appears from the above statement that the thirty-six-inch intake pipe cost about eight dollars and three cents (\$8.03) per foot, while the Centerville intake pipe for same size pipe and somewhat similar condition cost \$8.07 per lineal foot.

RIGHT OF WAY.

The only additional land acquired by the Board during the year was a strip of land fifty feet wide between Centerville and Peltier lakes for canal purposes. There was a change in the alignment of the right of way between Pleasant and Sucker lakes, upon which work for the so-called Pleasant lake improvement was done.

The wagon road, which is partly on land controlled by the board on the south shore of the west arm of Vadnais lake, was opened up, and a small amount expended to put it in a passable condition. This was done for the purpose of shortening the length of haul in delivering the coal to and from the station by way of Rice street.

BUILDINGS AND GROUNDS.

During the year there was an addition built to the dwelling located on property of the Board at No. 409 Fairview avenue. This work cost, including the painting and repairing of old buildings, the sum of five hundred and thirty dollars (\$530), which details of cost were reported to the Board Dec. 23, 1898.

The brick addition made to the front of the McCarron lake pumping station was for the purpose of making a vestibule for the main entrance and providing a proper place for the telephone service. This work cost nine hundred ninety-five dollars and sixty cents (\$995.60), which details of cost were reported to the Board Dec. 27, 1898.

SUMMARY OF RECOMMENDATIONS.

In the recommendations of work to be done this year I have included some of what was mentioned in my last year's annual report, and such other work as it has occurred to me should be suggested for your consideration:

Relay what cement mains are now in use with cast iron pipe, excepting Lake Phalen supply, which amounts to 2,520 lineal feet of six-inch pipe.

Lay a main on Maryland street, from Courtland to McMenemy street, as a cross feeder from high service to supply Dayton's Bluff and Arlington Hills. The necessity of this is very apparent, as the districts above referred to depend solely on the sixteen-inch main on Grove and Seventh streets, and if an accident should occur to this main practically all the eastern and northern portion of the city would be out of water until repaired. The damage and annoyance incident to a break (if it should occur) is a risk that the board is assuming, which I think should be removed by ordering the work done this year.

Blow-off on Vadnais lake conduit near waste weir B.

Iron fence around high service reservoir.

Lower the channel of stone arch culvert on the Vadnais and Sucker lake canal where it crosses under the county road near Moosbrugger's property.

Brick building for Vadnais lake pumping station.

Condemn a right of way and construct a canal between Otter and Bald Eagle lakes.

Put in and connect up with the public sewers blow-off pipes at all dead ends where there are dividing gates between the systems.

The charge made by the department for putting in temporary mains is not sufficient. The flat rate heretofore made of twenty cents per lineal foot, without regard to the size of the pipe put in, operates to the disadvantage of the department, and I would suggest that the charges be made according to the size of pipe put in, as follows: For three-quarter-inch galvanized iron pipe, twenty cents per lineal foot; for one-inch pipe, twenty-five cents per lineal foot; for one-and-one-quarter-inch pipe, thirty cents per lineal foot; for one-and-one-half-inch pipe, thirty-five cents per lineal foot, and for two-inch pipe, forty cents per lineal foot. And I would recommend the discontinuance of the laying of these temporary mains except in localities where it is very apparent that permanent mains would not be laid, and as a further reason of the unfairness of permitting one property owner having the privilege and benefit of water service without paying water frontage tax, while probably the adjacent property owner is compelled to pay.

For convenience in referring to the various tables, I have arranged them as follows:

No. of Table.	Subject.	Description of Subject.
1.	Mains.	Laid on high service during the year 1898.
2.	Mains.	Laid on low service during the year 1898.
3.	Mains.	Laid on west side high service during the year 1898.
5.	Mains.	Transferred from Phalen to high service in 1898.
6.	Mains.	Transferred from Vadnais to Phalen in 1898.
11.	Mains.	Location and size of all on high service Jan. 1, 1899.

12. Mains. Location and size of all on low service Jan. 1, 1899.
13. Mains. Location and size of all on west side high service Jan. 1, 1899.
4. Mains. Summary of all sizes and mileage in the city Jan. 1, 1899.
7. Hydrants. Fire, placed during the year 1898.
17. Hydrants. Fire, location and number of all up to Jan. 1, 1899.
7. Hydrants. Fire, summary as to districts.
8. Hydrants. Sprinkling, placed during the year 1898.
18. Hydrants. Sprinkling, location and number of all up to Jan. 1, 1899.
9. Valves. Placed during the year 1898.
10. Valves. Summary as to sizes, etc., up to Jan. 1, 1899.
14. Valves. Total number and location on high service Jan. 1, 1899.
15. Valves. Total number and location on low service Jan. 1, 1899.
16. Valves. Total number and location on west side high service Jan. 1, 1899.
19. Inventory. Stock on hand, pipes, specials, gates and hydrants.

Respectfully submitted,

A. R. STARKEY,
Superintendent.

TABLE NO. 1

PIPE LAID ON HIGH SERVICE DURING THE YEAR 1898.

DATE.	Street.	From.	To.	4-Inch.	6-Inch.	20-Inch.	24-Inch.	30-Inch.
April 30..	Force main.....	At McCarron pumping station.				60	46	70
May 20..	Geranium.....	Payne av.....	Greenbrier av		697			
May 25..	Geranium.....	Arcade	Mendota		640			
June 4..	Frances.....	Mendota.....	Forest		663			
June 15..	McLean av.....	Earl.....	Hester		643			
July 11..	Geranium.....	Mendota	Forest		680			
July 11..	Forest.....	Geranium....	48 feet southerly		48			
July 19..	Sherburne av....	Lexington	Dunlap		612			
July 22..	Taylor av.....	Charlotte	Aldine		431			
July 28..	Ellis.....	Raymond.....	Territorial road		523			
July 30..	Summit court....	Summit av....	Alley in Sum. ct.	260				
Aug. 5..	Bradford.....	Endicott.....	75 feet easterly		75			
Aug. 16..	Reaney.....	St. P. & D. R. R...						
		Greenbrier av			241			
Sept. 1..	Suction main.....	At McCarron pumping station.						771
Sept. 16..	Frank.....	Margaret	Minnehaha		652			
Sept. 23..	Geranium.....	Cypress	Forest		639			
Oct. 22..	Marion.....	Atwater	Front		1,299			
Oct. 28..	Arkwright.....	Jessamine	Magnolia		327			
Oct. 28..	Magnolia.....	East of Arkwright.....			19			
Nov. 1..	Rose.....	Greenbrier	Walsh		433			
Nov. 3..	Reaney.....	Present term....	Greenbrier av		240			
		Total..		260	8,862	60	46	841

Total 4-inch pipe.....	260
Total 6-inch pipe.....	8,862
Total 20-inch pipe.....	60
Total 24-inch pipe.....	46
Total 30-inch pipe.....	841

Total on high service..... 10,069 feet, or 1.907 miles.

- 154 feet of 24-inch suction main has been relaid with 36-inch pipe.
- 30 feet of 20-inch force main has been taken up.
- 30 feet of 20-inch force main has been abandoned.
- 70 feet of 24-inch force main has been taken out.

TABLE NO. 2.

PIPE LAID ON LOW SERVICE DURING THE YEAR 1898.

DATE.	Street.	From.	To.	6-Inch.
June 22.....	Roble.....	Stryker	Winslow	328
June 30.....	W. Winifred.....	143 ft.w. of w. line of Bellows.	Charlton	510
Oct. 25.....	Pennsylvania av....	17 ft.e.of w. l. of Columbia,	300 ft. w'ly	300
Nov. 20.....	James.....	Bay	Warsaw	587
Dec. 17.....	Harrison av.....	Lawton	Goodrich	410
		Total		2,135

Total on low service, 2,135 feet, or 0.404 miles.

Locust, from Eighth to Tenth, has been relaid with 524 feet 16-inch castiron pipe.

TABLE NO. 3.
PIPE LAID ON WEST SIDE HIGH SERVICE DURING THE YEAR 1898.

DATE.	Street.	From	To.	6-Inch.
June 28...	Ohio.....	Cherokee	Alice	415
Aug. 4.....	Smith av.....	Baker	Morton	342
Sept. 9.....	Smith av.....	Stevens	George	362
Sept. 19.....	George.....	Smith avenue..	40 feet west of Manomin	247
		Total		1,366

Total on West Side high service, 1,366 feet, or 0.2587 miles.

TABLE NO. 4.
SUMMARY OF WATER PIPE LAID IN THE CITY OF ST. PAUL,
JAN. 1, 1899.

SYSTEM.	4-Inch.	6-Inch.	8-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.	Total Feet.	Total Miles.
High Service..	38,807	571,692.9	.....	120,874	87,188	36,224	15,317	10,075	9,100	889,277.9	168.4238
Low Service ..	35,754	186,924.5	6,732	50,640	38,067	8,342	8,765	16,436	18	351,678.5	66.6058
W.S. High Service	.....	34,504.0	.....	7,219	3,950	.....	.....	.....	.....	35,678.0	6.7562
Total.....	74,561	783,121.4	6,732	178,733	129,205	44,566	24,082	26,511	9,118	1,276,629.4	241.7858

Total 4-inch pipe.....	74,561
Total 6-inch pipe.....	783,121.4
Total 8-inch pipe.....	6,732
Total 12-inch pipe.....	178,733
Total 16-inch pipe.....	129,205
Total 20-inch pipe.....	44,566
Total 24-inch pipe.....	24,082
Total 30-inch pipe.....	26,511
Total 36-inch pipe.....	9,118

Grand total.....1,276,629.4 feet, or 241.7858 miles.

TABLE NO. 5.
MAINS TRANSFERRED FROM LAKE PHALEN SERVICE TO HIGH
SERVICE IN 1898.

Street.	From.	To.	4-Inch.	6-Inch.
Bradley	Beaumont	Minnehaha	498	.....
Belford	North	Minnehaha	.....	1,327
Beaumont	De Soto.....	Payne .....	.....	1,881
Burr	Collins	Fauquier .....	.....	1,685
Collins	Lafayette	Bedford .....	.....	1,016
Decatur	Bedford	Beaumont .....	.....	710
De Soto.....	North	Collins .....	.....	273
Edgerton	Minnehaha	Reerney .....	.....	328
Fred	Burr	Bedford	337	.....
Jessie	Minnehaha	Fauquier .....	.....	634
Minnehaha	De Soto.....	Payne .....	.....	1,707
North	De Soto.....	Bedford .....	.....	851
Payne av.....	Beaumont	Omaha R. R.	.....	1,162
Preble	Beaumont	Minnehaha	.....	411
Reerney	Edgerton... ..	St. Paul & Duluth R. R.	.....	905
	Total		835	12,950

Total 4-inch mains transferred. 835 feet.
Total 6-inch mains transferred, 12,950 feet.

TABLE NO. 6.

MAINS TRANSFERRED FROM VADNAIS LAKE SYSTEM TO LAKE PHALEN SYSTEM IN 1897 AND 1898.

	Street.	From Street to Street.	4-Inch.	6-Inch.	8-Inch.	12-Inch.
Transferred in 1897.	Norris.....	Temperance to Canada.....	761			
	Spruce.....	Sibley to Canada.....	328			
	Tenth.....	Jackson to Broadway.....				1,324
	Ninth.....	Jackson to Broadway.....		1,300		
	Elghth.....	Jackson to Broadway.....			1,300	
	Temperance.....	Elghth to Grove.....	1,200			
	Sibley.....	Seventh to Spruce.....	1,291			
	Wacouta.....	Seventh to Spruce.....	750			294
	Canada.....	Ninth to Grove.....		1,200		
	Eleventh.....	Cedar to Jackson.....		1,238		
Transferred in 1898.	Tenth.....	Cedar to Jackson.....	441	730		
	Ninth.....	Cedar to Jackson.....		1,150		
	Elghth.....	Cedar to Jackson.....	830	820		
	Minnesota.....	Seventh to Twelfth.....	1,420			
	Robert.....	Seventh to Twelfth.....		1,660		
	Jackson.....	Seventh to Twelfth.....				1,660
	Total		6,586	8,068	1,300	3,278

Total 4-inch main..... 6,586
 Total 6-inch main..... 8,068
 Total 8-inch main..... 1,300
 Total 12-inch main..... 3,278

Total 19,262

TABLE NO. 7.

HYDRANTS PLACED IN 1898.

No.	LOCATION.	Service.	Double or Single Steamer.	Size of Pipe.	Pressure at Hydrant.
2250.....	Geranium and Mendota, n. w. cor.....	High	Single.....	6-inch....	48
2251.....	McLean av. and Hester, n. w. cor.....	High	Single.....	6-inch....	54
2252.....	Ohio and Cherokee av., s. w. cor.....	W. S. high.	Single.....	6-inch....	95
2253.....	Robie and Winslow av., n. w. cor.....	Low	Single.....	6-inch....	22
2254.....	Winifred and Charlton, n. e. cor.....	Low	Single.....	6-inch....	15
2255.....	Sherburne av. and Dunlap, n. e. cor..	High	Single.....	6-inch....	43
2256.....	Taylor av. and Aldine, n. w. cor.....	High	Single.....	6-inch....	30
2257.....	Smith av. and Morton, n. w. cor.....	W. S. high.	Single.....	6-inch....	44
2258.....	Reaney, near Hamm railroad tracks..	High	Single.....	6-inch....	73
2259.....	Smith av. and George, n. w. cor.....	W. S. high.	Single.....	6-inch....	62
2260.....	Smith av. and Stevens, n. w. cor.....	W. S. high.	Single.....	6-inch....	55
2261.....	Geranium and Cypress, n. w. cor.....	High	Single.....	6-inch....	40
2262.....	Marion and Wayzata, n. w. cor.....	High	Single.....	6-inch....	65
2263.....	Marion and Milford, n. w. cor.....	High	Single.....	6-inch....	67
2264.....	Marion and Atwater, n. w. cor.....	High	Single.....	6-inch....	68
2265.....	Pennsylvania av., 283 ft. w. of Columbia	Low	Single.....	6-inch....	26
2266.....	Rose and Greenbrier, n. e. cor.....	High	Single.....	6-inch....	46
2267.....	James and Bay, n. e. cor.....	Low	Single.....	6-inch....	34
2268.....	Harrison and Goodrich, n. w. cor.....	Low	Single.....	6-inch....	34

New hydrants, placed during the year 1898 on high service..... 10
 New hydrants, placed during the year 1898 on low service..... 5
 New hydrants, placed during the year 1898 on W. S. high service..... 4
 Total for the year..... 19

Hydrant No. 1385 has been moved to Geranium and Forest, northwest corner.
Twenty-six hydrants have been changed from low service to high service.

DISTRICTS.	Double Steamer.	Single. Steamer.	Total No. of Hydrants in Each District.
Low service, Lake Phalen.....	16	107	123
Low service, lake Vadnais.....	119	494	613
High service, reservoir.....	11	1,426	1,437
High service, West Side.....		95	95
Total	146	2,122	2,268

TABLE NO. 8.

STREET SPRINKLING HYDRANTS PLACED IN 1898.

No.	Location.	Measurement of Valve from Standpipe.
292	Milton and Iglehart, northwest corner....	43 feet south; 7 feet east.
293	Front, west of Grotto, north side.....	8 feet.
294	Chatsworth and Front, northwest corner..	9 feet east; 37 feet south.
No. 119	has been moved from Minnehaha and Burr to Osceola and Pleasant, northeast corner	3 feet.
No. 155	has been moved from Grotto and Holly, southerly on Grotto, 20 feet north of alley in block 14.....	28 feet.
No. 136,	Como and Elfelt, moved some.....	34 feet west, 13 feet north.
No. 227,	Front, east of Grotto, north side, moved 290 feet easterly	7 feet.
No. 242	has been moved from Front and Colne to Victoria and Front, northwest corner	8 feet.
No. 60	has been moved from Cedar and Aurora to Aurora and Cedar.....	48 feet east, 7 feet south.
No. 277	has been moved northerly on St. Albans to 20 feet north of alley in block 6.....	178 feet south, 5 feet east.
No. 128,	Cedar and Fifth, has been reset.....	6 feet.
No. 66,	Locust and Ninth, has been reset.....	7 feet.
Number placed this year.....		3
Total placed to date.....		294

TABLE NO. 9.

VALVES PLACED IN 1898.

Street.	LOCATION.	4-inch.	6-inch.	30-inch.
Bradley.....	2½ feet north of south line of North.....		1	
Robie.....	East line of Winslow.....		1	
Winifred.....	East line of Charlton.....		1	
Harrison av.	East line of Lawton.....		1	
Ohio.....	North line of Alice.....		1	
Smith av.....	South line of Baker.....		1	
Beaumont.....	West line of Burr.....		1	
Bradley.....	South line of Minnehaha.....	1		
Ellis.....	West line of Raymond.....		1	
Forcemain.....	At McCarron pumping station.....			1
Forcemain.....	By-way to above gate.....		1	
Frances.....	East line of Mendota.....		1	
Frank.....	North line of Margaret.....		1	
Frank.....	North line of Beech.....		1	
Geranium.....	West line of Greenbrier.....		1	
Geranium.....	East line of Arcade.....		1	
Geranium.....	East line of Forest.....		1	
Marion.....	South line of Front.....		1	
McLean av.....	East line of Earl.....		1	
Reaney.....	East line of Greenbrier.....		1	
Sherburne av	West line of Lexington.....		1	
Summit ct....	South line of Summit av.....	1		
Suction main	At McCarron pumping station.....			1
Suction main	By-way to above gate.....		1	
Suction main	Blow-off at McCarron station.....		1	
Taylor av....	East line of Aldine.....		1	
Total		2	22	2

Total on low service..... 4
Total on W. S. high service..... 2
Total on high service..... 20

Total 26

Two 4-inch and twenty 6-inch valves have been transferred from low service to high service.

TABLE NO. 10.

TOTAL NUMBER OF VALVES ON ALL SYSTEMS JAN. 1, 1899.

SIZES IN INCHES.	Low Service.	High Service.	West Side, High Service.	Total.
3 inches.....	15	23		38
4 inches.....	113	115		228
6 inches.....	436	950	40	1,426
8 inches.....	26	2		28
12 inches.....	76	137	8	221
16 inches.....	37	67	5	109
20 inches.....	10	33		43
24 inches.....	5	9		14
30 inches.....	5	6		11
36 inches.....	1	5		6
Total	724	1,347	53	2,124

TABLE NO. 11.

LOCATION, SIZE AND

FEET OF WATER MAINS LAID ON
TO JAN. 1, 1900.

FEET

WATER MAINS ON HIGH SERVICE—Continued.

	14-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
		256				
	3411	3313				
		4000				
	2110	5290	1453	14500	9724	1800
	4675					
	3593	2291				
	4272					
	10475	12	12			
	518					
Fairview st						
Feronia.....						
Fremont						
Fairview av	2542	1071				
Fry						
Frank.....						
Frances						
Fred						
Forest						
Forcemain..			7886	46	111	7886
Flandrau						
Grand						
Grove		2618				
Grotto						
Goodrich..						
Greenbrier.						
Gaultier						
Gordon	693					
Genesee						
Granite						
Geranium						
Hoffman						
Holly						
Hague						
Hudson	124					
Hastings	3000					
Hewitt						

WATER MAINS ON HIGH SERVICE—Continued.

		12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
	1166						
	1733						
		1308					
	419	980					
349	14706						
	236	2237	145				
	656						
	6084						
	8630						
	5269						
	1834						
	924						
2201							
	767						
	1211						
	8297						
	450						
	8686						
	8390						
	2122						
	606						
	7340						
	1850		3818				
	415		427				
	181	670					
		1236	838				
	447						
	1142						
	1256						
	454						
	2621						
	1142						
		28					
	5708						
	2060	811					
	4782						
	7789						
	5481						
	2540	10108					
	5717						
	2928						
	6071	7473					
	1806						
	655	3286					
Mt. Airy. L'Orient to Robert . . .	2024						
Maryland .. Dale to Arcade	3856	22					
Mound to 335 feet west							
	1298	1536					
Milwaukee. Merriam Park to Astoria . . .	570						
Manvel .. Robbins to Raymond	1142						
Mulberry. Third to Sixth	435						
Milford.	656						
Minneapolis.		18					
McMenemy.		1662					
Mississippi .. Ry. to							
Cayuga	1136						

WATER MAINS ON HIGH SERVICE—Continued.

STREET.	FROM STREET TO STREET.	4-Inch.	6-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
Manitoba...	Rice to Sylvan.....		1139						
Macalester...	Summit to Princeton....		1885						
Mt. Ida.....	De Soto to Rivoli.....		535						
Milton.....	Victoria to Lombard.....		336.5						
Nelson.....	Summit to Western.....		2422						
Nina.....	Summit to Selby.....		800						
North.....	De Soto to Seventh.....		1880						
Nourse.....	Gordon to N. P. Ry....		302						
Oakland.....	Ramsey to Summit.....		3662						
Olive.....	Olmsted to Pennsylvania		1057						
Oakley.....	Lynnhurst west to Prior.		451						
Osceola.....	Pleasant to Chatsworth.		3709						
Otsego.....	Lafayette to Mt. Ida....		791						
Park pl.....	Park drive southwest...	574							
Park av.....	Martin to Cook.....		2094						
Princeton...	Macalester to Baldwin..		1399						
Pine.....	Grove to Pennsylvania..		1820		387				
Portland....	Summit to Victoria.....		5290						
Penns'l'vania	Rice to Pine.....	505	342						
Preble.....	Beaumont to Minnehaha		471						
Payne.....	Beaumont to Ivy.....		6791						
Plum.....	Maple to Hoffman.....		1150						
Prior.....	Selby to University.....		804	3447					
Pascal.....	Minnehaha to Taylor....		1743						
Pym.....	Bayless to Eustis.....			736					
Priscilla....	Raymond avenue east...		542						
Pratt.....	Raymond to Gibbs.....		762						
Phalen.....	Seventh to Stillwater...			1467					
Pacific.....	Cypress to Hester.....		1260						
Pleasant....	Osceola to St. Albans...			560					
Poplar.....	N. P. R. R. yard to Cortland		869						
Rice.....	College to Jessamine....		495	2147	5990	1154			
Robert.....	171 feet south of Univer- sity to 254 north of same		425						
Rondo.....	Rice to Terrace Park av.		10061						
Ramsey.....	Oakland to Summit.....		1259						
Ross.....	Atlantic to Seventh.....		2467						
Ravoux.....	Rondo to Fuller.....	616							
River.....	Maria to Hoffman.....	359							
Ravine.....	Maple to 344 feet west of Maria	1423							
Raymond...	University to Langford..		3205		1588				
Robbins.....	Bayless to Raymond Pk.		440						
Reaney.....	Edgerton to English....		7834						
Rose.....	Edgerton to Arcade.....		1930						
Sherb'ne av.	Dunlap to Jackson.....	400	11082						
St. Anthony.	Rice to Cleveland.....		13893						
St. Peter....	College to University....		2557						
Selby.....	Summit to Prior.....		17002						
Seventh.....	Grove to White Bear av.				15025				
Sinnen.....	Sixth to Seventh.....		541						
Summit av..	C. P. D. E. to Baldwin..	913	5481	13384					
Summit pl..	Nelson to Fuller.....		2122						
St. Albans..	Pleasant to Martin.....	2306	300	556					
Sims.....	Edgerton to Earl.....		4539						
Sum'lt ct.a'y	East of Lawton.....		362						
Short.....	Maria to Hoffman.....		591						
Snelling....	Goodrich to G. N. Ry..				11195				
Simpson....	Blair to Hewitt.....		1528						
Sixth.....	Hoffman to Arcade.....		2646						
Sixth.....	College to Summit.....		537						
Sidney.....	Raymond to Ellis.....		1225.5						
Scudder....	Blake to Langford.....				1347				
St. Clair....	Victoria to Oxford.....			1935					
Stinson....	Gaultier to Western....		1266						
Sycamore...	Rice to Cortland.....			2509					
Syndicate...	Lincoln to Summit.....		967						

TABLE NO. 12.

LOCATION, SIZE AND

FEET OF WATER MAINS LAID ON
JAN. 1, 1899.

Armstrong...	Grace	334	595				
Arbor...			743				
Audubon...							
Ada		25					
Anita...		2302	667				
Banfil.			1944				
Bay			461				
Becker pl.			1647				
Belvidere...	to Concord						
Bradley	south of Grove						
	orth		1503				
Bellows	north		25				
*Broadway	Uni-						
	sity av	408	1723		1938		1741
	of Lafayette		47				
Bruno			935				
Bancroft	Concord to Congress		302				
Bidwell	Isabel to Congress		788				
Brunson	Partridge to North		2055				
Canada	Ninth to University		289	170	2573		614
Cedar	Summit to Second		1235				
Chestnut	Seventh to Washington		1763				
Colborne	Jefferson to Superior		1670				
College							
Cross Miss.							
river					6800		
Concord							
Congress		392	6425				
			741				
Chicago			1240				
Colorado...			408				
Clinton			745				
Columbia			250.5				
Cliff			180		1540		
De Soto...	Hopkins to Becker pl.		1144				
Douglas...	Seventh to Ramsey		1893				
Duke	Cascade to St Clair		576				
Douman	Von Minden to Goodhue		1011				
Delos			1050				
Daly	James to Jefferson		705				
Dearborn	Robert to Gorman		1449				
Eagle	Spring to Seventh						
Eighth	east	1425		3321			
			1238				
Eleventh							
Elm.	M &	408					
Exchange...	n	3062	325				
Eaton	Irland						
	crossings		51		100		
Erie	Clair to Cascade		1807				
Emma	Western to Short Line	873					
Fairfield	late to Wabasha		2812				
Fauquier				1052			
Fifth		1458	3120	2935			
Fort						1616	
Fourth	east						
	of Kittson		4865	2679			
Fourteenth	Broadway to Robert		1368				
Franklin	Elm to Ninth	8308					
Fillmore			2908				
Forbes	Wilkin to Douglas		1274				
Garfield	Ramsey to Goodrich		1002				
Goodhue	Cliff to Duke		2817				

*Includes portion of Mississippi street south of Grove street.

WATER MAINS ON LOW SERVICE—Continued.

STREET.	FROM STREET TO STREET.	4-Inch.	6-Inch.	8 Inch.	12-Inch.	16 Inch.	20-Inch.	24-Inch.	30-Inch.
Roble.....	Winslow to Andrew.....		2609						
St. Clair....	Cliff to Colborne.....		985		112				
St. Peter....	Third to College.....		2866						
Seventh.....	Duluth R. R. to Tuscarora	350	1000		470	15356	1508		
Second.....	East of Robert.....		18						
Sherman....	Bluff to Pleasant.....		1937						
Sixth.....	Kittson to Pleasant.....	1836	2044	3235					
Sibley.....	Levee to Norris.....	1626	1462						
Smith.....	College to Cliff.....		3704						
Somerset....	John to Pine.....		669						
Spruce.....	Sibley to Pine.....	683							
State.....	Mississippi river to West Side pump house.....					7704			
Summit.....	Robert to Cedar.....		859						
Stryker.....	George to Prospect ter..		2106						
Stewart.....	Tuscarora to Bay.....		909						
Temperance..	Elighth to Thirteenth... 1509								
Tenth.....	Grove to College.....	441	1255		2280	139	1300		
Third.....	Pleasant to west end of Third street bridge.....		847		6648				
Thirteenth..	Pine to Jackson.....		2075						
Thompson....	Ramsey to Pleasant.....		545						
Twelfth.....	Jackson to Cedar.....						1274		
Toronto.....	Seventh to Jefferson....		692						
Tennessee...	Crossing State.....		51						
Tuscarora...	Stewart to Milton.....		2624						
Van Slyke Court.....	Broadway to Olive.....	557							
Von Minden..	Dousman to Western....		897						
View.....	Seventh to Palace.....		2081						
Wacouta....	Union Depot ground to Spruce	783	118		1736				
Walnut.....	100 feet south of I. P. to Pleasant	2420							
Warsaw.....	Audubon to Palace.....		1030						
Washington..	Chestnut to Seventh....	1047			1236				
Waverly pl..	Lafayette to John.....		411						
Webster.....	Clay to Seventh.....		316						
Western.....	Milwaukee Ry to Pleasant		2550						
Westminster	Waverly place to N. P. Ry		1022						
Willis.....	Fifth to Seventh.....	550							
Wilkin.....	Short Line Ry. to Pleasant		1209						
Winifred....	Charlton to Andrew.....		6097						
Whitney & Smith's ad	Alley, block 15.....		355.5						
Woodward..	Bradley to John.....	683							
Wabasha....	Goff to Summit.....		6965						
Watson.....	View to Chatsworth....		2133						
Winslow....	Isabel to Prospect ter..		745						
Yankee.....	Seventh to Dousman....	678							
Main old line	Fauquier to Lake Phalen					6000		7024	
Total		35754	186924.5	6732	50640	38067	8342	8765	16436

Total 4-inch pipe.....	35,754
Total 6-inch pipe.....	186,924.5
Total 8-inch pipe.....	6,732
Total 12-inch pipe.....	50,640
Total 16-inch pipe.....	38,067
Total 20-inch pipe.....	8,342
Total 24-inch pipe.....	8,765
Total 30-inch pipe.....	16,436
Total 36-inch pipe.....	18

Total 351,678.5 feet, or 66.6058 miles.

There are 16,135 feet of tunnels for mains and 900 feet of tunnels for fire hydrants in the sand-rock district. Size of same, 6 feet in height and 3.5 feet in width, tapering towards top to 1.5 feet.

There are also 11 ventilating and riser shafts, and 49 hydrant shafts 7 feet in diameter at bottom and tapering towards top to about 2 feet. They are bricked from top of solid rock to a height of about 10 feet.

TABLE NO. 13.
LOCATION, SIZE AND NUMBER OF FEET OF WATER MAINS LAID ON
HIGH SERVICE, WEST SIDE, TO JAN. 1, 1899.

STREET.	FROM STREET TO STREET.	6. Inch.	12- Inch.	16- Inch.
Annapolis	At Manomin.....		100	
Alke	Ohio to the Park.....	141		
Baker	Bidwell to Cherokee.....		3,539	
Belvidere	South Robert to Oakdale.....	851		
Bidwell.....	Morton to Roble.....		346	362
Bunker	Oakdale to Brown.....	1,808		
Cherokee avenue.....	Annapolis to N. L. of Smith avenue.....	4,349		
Force main.....	From Annapolis to Tank.....		100	
Curtice	Oakdale to 250 feet east of Woodbury.....	1,437		
George	Stryker to Smith avenue.....	3,581		
Hall avenue.....	Morton to Louisa.....	894		
Manomin	Baker to Annapolis.....		2,540	
Morton.....	Robert to Bidwell.....			2,672
Oakdale avenue.....	Midway to Curtice.....	1,319		
Orleans	Cherokee to Page.....	2,517		
Ohio	Winona to Cherokee.....	3,900		
Page	Robert to Harvard.....	1,344		170
Robert	Belvidere to Morton.....		594	606
Roble	Bidwell to Bellows.....	522		
State	Page to Pump House.....			140
Sidney	Ottawa to Cherokee.....	346		
Smith avenue.....	Morton to George.....	704		
Stryker avenue.....	Tyler to Augusta.....	791		
Totals		24,504	7,219	3,950

Total 6-inch pipe..... 24,504
Total 12-inch pipe..... 7,219
Total 16-inch pipe..... 3,950

Total 35,673 feet or 6.7562 miles.

TABLE NO. 14.
LOCATION OF VALVES (HIGH SERVICE).

STREET.	LOCATION.	3-Inch.	4-Inch.	6-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
Arundel	North line of Summit									
Arundel	South line of Selby									
Arundel	North line of Dayton									
Arundel	North line of Marshall									
Arundel	North line of Charles									
Arundel	North line of Edmund									
Arundel	North line of Thomas									
Ashland	West line of Western									
Ashland	East line of Mackubin									
Ashland	East and west line of Dale									
Ashland	East line of Grotto									
Ashland	East and west line of Victoria									
Ashland	East line of Chatsworth									
Aurora	West line of Rice									
Aurora	East line of Jay									
Aurora	West line of Farrington									
Aurora	East and west line of Western									
Aurora	East line of Mackubin									
Aurora	East and west line of Dale									
Aurora	West line of Victoria									
Aurora	South line of University									
Arcade	North line of Dawson									
Arcade	North and south line of Seventh									
Arcade	North line of Minnehaha									
Arcade	South line of Omaha Ry									
Arcade	North line of Duluth Ry, B. O.									
Arcade	North and south line of Case									
Arcade	South line of Magnolia									
Arcade	North line of Fauquier				1					
Arcade	154 1/2 feet south of Wells, H									
Astoria	South line of Van Buren									
Ashbury	North line of St. Anthony									
Arch	West line of Mt. Vernon									
Arch	East line of Jackson									
Atlantic	North and south line of Seventh									
Atlantic	South line of Ross									
Atwater	East line of Rice									
Agate	East line of Cortland									
Agate	North line of Granite									
Agate	South line of York									
Avon	South line of Marshall			1						
Avon	North line of Igchart			1						
Avon	North line of Carroll			1						
Avon	North line of St. Anthony			1						
Arlington	East line of Payne			1						
Argyle	North line of Front			1						
Atchafalpa	South line of Wauzata			1						
Atchafalpa	South line of Front			1						
Baker Ave	North line of Chisway				1					
Baker Ave	South line of Seventh				1					
Berk	East and west line of Earl									
Berk	East line of Forest									
Berk	East line of Mendota									
Berk	South line of Seventh									
Blair	West line of Western									
Blair	East line of Mackubin									
Blair	East line of Dale									
Blair	East line of Aldine									
Blair	East line of Fairview									
Braclaw	B. O. north line of Thirteenth	1								
Braclaw	North line of Valley				1					
Brewster	North line of University				1					
Brewster	North line of Sherburne				1					
Burr	North line of Collins				1					
Burr	North line of Beaumont				1					
Burr	South line of York				1					
Burr	North and south line of Case				2					
Burr	South line of Lawren				1					

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET.	LOCATION.	3-inch.	4-inch.	6-inch.	12-inch.	16-inch.	20-inch.	24-inch.	30-inch.	36-inch.
Como	East line of Claghorn on H.		1							
Como	South line of Lafond on H.		1							
Como	East and west line of Gaultier, M. and H.		1				1			
Como	East line of Elfeldt on H.		1							
Como	North line of Van Buren on H.		1							
Como	North line of Minnehaha on H.		1							
Como	West line of Virginia on H.		1							
Como	East and west line of Western, M. and H.		1				2			
Como	South line of Atwater, B. O.			1						
Como	South line of Topping.						1			
Como	East line of Dale.						1			
Cherry	East line of Hoffman.			1						
Cook	East and west line of Arcade.			2						
Cook	West line of Greenbrier.			1						
Cook	East line of Edgerton.			1						
Cook	East and west line of McMenemy.			2						
Cook	East line of Rice.			1						
Cook	East line of Cortland.			1						
College	West line of Sixth.			1						
Collins	West line of Bedford.			1						
Case	East and arcade.				2					
Case	West line.				1					
Case	East and				2					
Case	West line of De Roto.				1					
Case	West line of McMenemy.			1						
Claghorn	South line of Blair.			1						
Cromwell	North and south line of Pym.			2						
Cudworth	West line of Lanaford.			1						
Clark	North line of Whitall.			1						
Clark	South line of Case.			1						
Cross	West line of Argyle.			1						
Cross	West line of Oxford.			1						
Cross	East line of Lexington.			1						
County road	South line of Dooley on H.			1						
Crocus place	South line of Godrich.			1						
Crocus place	South line of Fairmount.			1						
Chatsworth	North line of Evergreen.			1						
Chatsworth	North line of Union.			1						
Cleveland	South line of University.					1				
Cleveland	South line of Myrtle on H.			1						
Cleveland	South line of Wabash on H.			1						
Cleveland	200 feet on H.			1						
Cleveland	South line.			1						
Cleveland	North line.					1				
Cleveland	Head of Rondo on H.			1						
Cleveland	South line of Marshall.				1					
Cleveland	South line of Laurel.				1					
Cleveland	North and south line of Summit.				2					
Cortland	North and south line of Sycamore.			1		1				
Cortland	North line of Agate on H.			1						
Cortland	North line of York on H.			1						
Cortland	North line of Poplar on H.			1						
Cortland	North line of Case on M. and H.			1		1				
Cortland	North line of Jenks on H.			1						
Cortland	North line of Lawson on H.			1						
Cortland	At Cook on H.			1						
Cortland	North line of Magnolia on H.			1						
Cortland	North line of Jessamine on H.			1						
Cortland	North line of Geranium on H.			1						
Cortland	North line of Rose on H.			1						
Cortland	South line of Maryland on H.			1						
Carter	East line of Gordon.			1						
Cayuga	West line of Mississippi.			1						
Cayuga	East line of Agate.			2						
Cayuga	East line of Cortland.			1						
Chelton	West line of Tatum.			1						
Churchill	North line of Front.			1						
Churchill	North line of Hatch.			1						
Churchill	South line of Cross.			1						
Churchill	South line of Van Slyke.			1						

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET.	LOCATION	3-inch.	4 inch.	6 inch.	12-inch.	16-inch.	20 inch.	24-inch.	30-inch.	36-inch.
Ellis.....	West line of Raymond avenue.....			1						
Ellis	East line of Bradford			1						
Everett court	South line of Wheeler			1						
Evergreen..	West line of Victoria.....			1						
Farrington..	North line of Summit			1						
Farrington..	North line of Laurel			1						
Farrington..	North and south line of Dayton.....			2						
Farrington..	North line of Nelson.....			1						
Farrington..	South line of Carroll.....			1						
Farrington..	South line of Rondo.....			1						
Farrington..	North line of Sherburne.....			1						
Farrington..	North line of Thomas.....			1						
Fauquier....	West line of Duluth			1						
Fauquier....	East and west line of Earl.....			2						
Fauquier....				2						
Fauquier....	East and west line of			2						
Fuller	West line of Rice.....			1						
Fuller	East line of Louis			1						
Fuller	West line of Farrington			1						
Fuller	East and west line of Western.....			2						
Fuller.....	East line of Mackubin.....			1						
Fuller.....	East and west line of Dale.....			2						
Fuller.....	West line of Victoria			1						
Fuller.....	East line of Chatsworth.....			1						
Fuller.....	East line			1						
Fifth	East and west line of Bates.....			2						
Floral.....	South line of Summit.....		1							
Fourth.....	East and west line of Mendota.....			2						
Fourth.....	East line of Maple			1						
Fourth.....	East and west line of Bates			2						
Fourth.....	East and west line of Earl.....			2						
Frances.....	East and west line of Mendota.....			2						
Frank	North line of Margaret			1						
Frank	North line of Birch			1						
Frank.....	East line of Burr.....		1							
Front	West line of Como.....				1					
Front	East and west line of Rice.....			1	1					
Front	East line of Gaubler.....				1					
Front	East and west line of Western.....				2					
Front	East line of Mackubin.....				1					
Front	At Dale street				1	1	1			
Front	East line of Grotto				1					
Front	East and west line of Victoria.....				2					
Front	East line of Chatsworth				1					
Front	East line of Lexington.....				1					
Forest	North line of Conway.....			1						
Forest	North line of Third.....			1						
Forest	North line of Fremont			1						
Forest	North line of Fourth			1						
Forest	North line of Dawson			1						
Forest	North line of York.....			1						
Forest	South line of Chase			1						
Forest	North line of Jasmine			1						
Forest	150 feet			1						
Fairmount	East of St. Albans 275 feet.....			1						
Fairmount..	East line of Grotto			1						
Fairmount..	East line of Victoria			1						
Fairmount..	West line of Victoria			1						
Ferris.....	West line of Laura.....			1						
Ferris.....	East line of Prior.....			1						
Ferris.....	West line of Fairview			1						
Fremont	East and west line of Mendota.....			2						
Fairview ..	At Shields on H			1						
Fairview..	North and south line of University, M H and B O	1		1		2				
Fairview ..	At Sherburne on H			1						
Fairview ..	North line of Thomas.....				1					
Fairview ..	North and south line of Minnehaha				2					
Fry	North and south line of Minnehaha		2							
Fry	South line of Van Buren.....		1							
Force main.	South of pumping station						1			
Force main	B. O., at Trout Brook.....			1						

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET.	LOCATION.	2-Inch.	4-Inch.	6-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
Hastings...	West line of Maple.....				1					
Hastings...	West line of Mound.....				1					
Hewitt...	East and west line of Hamline.....			2						
Hewitt...	West line of Sheldon.....			1						
Hewitt...	West line of Holton.....			1						
Hewitt...	West line of Simpson.....			1						
Hewitt...	East and west line of Snelling.....			2						
Hope.....	South line of Sixth.....			1						
Hope.....	South line of Seventh.....			1						
Hampden...	East line of Raymond.....			1						
Hampden...	West line of Hampden.....			1						
Harvester...	East line of White Bear.....				1					
Hazel...	South line of Ames.....				1					
Horton...	North line of Van Slyke.....			1						
Hardenberg place...	North line of Lyton.....		1							
Iglehart...	West line of Wabasha.....			1						
Iglehart...	East and			2						
Iglehart...	West line of Summit place.....			1						
Iglehart...	West line of Louis.....			1						
Iglehart...	West line of Farrington.....			1						
Iglehart...	East and			2						
Iglehart...	East line			2						
Iglehart...	East and			2						
Iglehart...	East line of Grotto.....			1						
Iglehart...	West line of Avon.....			1						
Iglehart...	East and west line of Victoria.....			2						
Iglehart...	East line			1						
Iglehart...	East and			2						
Iglehart...	East and			2						
Jackson...	North line			1						
Jackson...	South line			1						
Jackson...	North and				1	1				
Jackson...	South line of Pennsylvania.....				1					
Jackson...	South line of Sycamore.....				1					
Jay.....	South line of Martin.....			1						
Jay.....	South line of Fuller.....			1						
Jessamine...	East and			2						
Jessamine...	West line			1						
Jessamine...	East and			2						
Jessamine...	East line of Bradley.....			1						
Jessamine...	West line of Burr.....			1						
Jessamine...	West line of Clark.....			1						
Jessamine...	West line of Arkwright.....			1						
Jessamine...	East and west line of McMenamy.....			2						
Jessamine...	East line of Rice.....			1						
Jessamine...	East line of Forest.....			1						
Jessie...	North line of Case.....			1						
Jessie...	North line of Jenks.....			1						
Jessie...	North line of Lawson.....			1						
Jessie...	North line of Cook.....			1						
Jessie...	North line of Magnolia.....			1						
Jessie...	South line of Geranium.....			1						
Jessie...	South line of Rose.....			1						
Jessie...	South line of Maryland.....			1						
Jenks...	East and			2						
Jenks...	West line of Greenbrier.....			1						
Jenks...	East line of Edgerton.....			1						
Jenks...	West line of De Noto.....			1						
Jenks...	East line of McMenamy.....			1						
Jenks...	East line of Cortland.....			1						
Kent...	South line of Holly.....		1							
Kent...	South line of Ashland.....		1							
Kent...	South line of Laurel.....		1							
Kent...	South line of Selby.....		1							
Kent...	North line of Marshall.....		1							
Kent...	North line of Iglehart.....		1							
Knapp...	East line of Langford.....			1						
Knapp...	North line of Langford.....			1						
Keston...	South line of Carter.....			1						
Laura...	North and south line of Waltham.....			2						
Laura...	South line of University.....			1						

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET.	LOCATION.	3-Inch.	4-Inch.	6-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
Mackubin	South line of Holly			1						
Mackubin	South line of Ashland			1						
Mackubin	South line of Laurel			1						
Mackubin	South line of Selby			1						
Mackubin	North and south line of Dayton			2						
Mackubin	North line of Marshall			1						
Mackubin	North line of Iglehart			1						
Mackubin	North line of Carroll			1						
Mackubin	North line of Rondo			1						
Mackubin	North line of St. Anthony			1						
Mackubin	North line of Martin			1						
Mackubin	South line of Aurora			1						
Mackubin	North and south line of University			2						
Maple	South line of Hudson			1						
Maple	North line of Euclid			1						
Maple	North line of Conway			1						
Maple	South line of Fourth			1						
Maple	North line of Fifth			1						
Maple	South line of Seventh			1						
Margaret	East and west line of Earl			2						
Margaret	East line of Forest			1						
Margaret	East and west line of Mendota			2						
Margaret	North and south line of Seventh			2						
Margaret	East line			1						
Martin	East and			2						
Martin	West line			1						
Martin	West line			1						
Martin	East and			2						
Martin	East line			1						
Martin	East and			2						
Martin	West line of Victoria			1						
Maria	South line of McLean			1						
Maria	South line of Cherry			1						
Maria	North line of Plum			1						
Maria	North line of Hudson			1						
Maria	South line of Ravine			1						
Maria	North line of Conway			1						
Maria	South line of Fourth			1						
Maria	North line of Fifth			1						
Maria	North and south line of Seventh			1						
Marshall	West line of Western			1						
Marshall	East line of Mackubin			1						
Marshall	East and west line of Dale			1	1					
Marshall	West line of Grotto				1					
Marshall	East and west line of Victoria				2					
Marshall	East line of Chatsworth				1					
Marshall	West line of Snelling				1					
Marshall	West line of Aldine				1					
Marshall	East and west line of Fairview				2					
Marshall	East and west line of Prior				2					
Marshall	East and west line of Cleveland				2					
Mendota	North line of Hudson				1					
Mendota	B. O. at Euclid	1								
Mendota	South line of Fourth				1					
Mendota	North line of Margaret, M. and B. O.	1			1					
Mendota	North and south line of Seventh, M. and B. O.	1			1					
Mendota	South line of Fauquier				1					
Mt. Airy	East line of Linden				1					
Mt. Airy	West line of Warren				1					
Mt. Ida	West line of De Soto				1					
Maryland	West line			2						
Maryland	and				2					
Maryland										
Marion	North line of University				1					
Marion	North line of Sherburne				1					
Marion	North line of Charles				1					
Marion	North line of Edmund				1					
Marion	North line of Thomas				1					
Marion	South line of Front				1					
Minnehaha	East and west line of Earl			2						
Minnehaha	North and south line of Seventh			2						

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET.	LOCATION.	3-Inch.	4-Inch.	6-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
Pascal.	North line of Hewitt.			1						
Preble.	North line of Beaumont.			1						
Pine.	North line of Grove.					1				
Pine.	North line of Thirteenth.			1						
Pine.	North line of O'msted.			1						
Pine.	North and south line of Williams.			2						
Portland.	West line.			1						
Portland.	East line.			1						
Portland.	East and west line of Dale.			2						
Portland.	East line of Grotto.			1						
Portland.	East line of Victoria.			1						
Pennsylvania.	West line of Olive.			1						
Pennsylvania.	West line of Rice.			1						
Plum.	East.			1						
Plum.	East 1.			1						
Prior.	South line of Dayton.			1						
Prior.	North and south line of Marshall.			1	1					
Prior.	North line of St. Anthony.				1					
Prior.	South.				1					
Pym.	West.				1					
Phalen.	North.				1					
Poplar.	East 1.			1						
Princeton.	North.			1						
Princeton.	East.			1						
Pacific.	West line of Earl.			1						
Pacific.	East line of Earl.			1						
Reservoir.	On Reservoir grounds.		1		1					2
Rice.	North and south line of Summit, M. and B. O.	1		1		1				
Rice.	North line of St. Anthony.					1				
Rice.	North and south line of University, M. and H.					1	1			
Rice.	North line of Sherburne on H.		1							
Rice.	North line of Charles on H.		1							
Rice.	North line of B. O.		2							
Rice.	North and.					1	1			
Rice.	North line of Van Buren.				1					
Rice.	North and south line of Sycamore.				1	1				
Rice.	Lytton place on.			1						
Rice.	South line.			1						
Rice.	North and.					2				
Rice.	North line on.			1						
Rice.	North line of Lawson on H.			1						
Rice.	North line of Oak on H.			1						
Rice.	North line of Oliver on H.			1						
Robert.	South line of Aurora.			1						
Robert.	North and south line of University.			2						
Robert.	North line of Valley.			1						
Rondo.	West line of Rice.			1						
Rondo.	East line of Louis.			1						
Rondo.	West line of Farrington.			1						
Rondo.	East and west line of Western.			2						
Rondo.	East line of Mackubin.			1						
Rondo.	East and west line of Dale.			2						
Rondo.	East line of Grotto.			1						
Rondo.	West line of Avon.			1						
Rondo.	East and west line of Victoria.			2						
Rondo.	East and west line of Prior.			2						
Reaney.	West line of Duluth.			1						
Reaney.	East and west line of Earl.			2						
Reaney.	North.			2						
Reaney.	East and.			2						
Reaney.	West line of Payne.			1						
Reaney.	East line of Greenbrier.			1						
Reaney.	East line of Summit.			1						
Ross.	West line of Duluth.			1						
Ross.	East and.			2						
Ross.	South line of Seventh.			1						
Rayoux.	South line of St. Anthony.		1							
Rayoux.	South line of Fuller.		1							
Rayvine.	East and west line of Bates.		2							
Raymond.	North line of University, M. and H.			1		1				

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET	LOCATION.	2-Inch.	4-Inch.	6-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.
Summit av.	East and west line of Rice, M. and B. O.	1		1	1				
Summit av.	North and south line of Dayton.		1	1					
Summit av.	North line of Nina.			1					
Summit av.	East line of Western.			1					
Summit av.	East line of Mackubin.				1				
Summit av.	B. O. at Oakland	1							
Summit av.	East and west line of Dale.				2				
Summit av.	At St. Albans, B. O.		1						
Summit av.	East line of Grotto.				1				
Summit av.	East and west line of Victoria.				2				
Summit av.	East line of Chalmers.				1				
Summit av.	East and west line of Lexington.				2				
Summit av.	East line of Griggs.				1				
Summit av.	East and west line of Hamline.				2				
Summit av.	West line of Snelling.		1		1				
Summit av.	West line of Cambridge.			1					
Summit pl.	North line of Nelson.			1					
Summit pl.	South line of Carroll.			1					
Summit pl.	South line of Rondo.			1					
Summit pl.	South line of St. Anthony.			1					
Summit pl.	South line of Martin.			1					
Summit pl.	South line of Fuller.			1					
Summit et.	South line of Summit.		1						
St. Albans.	North line of Pleasant.				1				
St. Albans.	South of Kenwood, P. D.			1					
St. Albans.	South of Fairmount.			1					
St. Albans.	South of Summit avenue.		1						
St. Albans.	South of Laurel avenue.		1						
St. Albans.	North line of Marshall.		1						
St. Albans.	North line of Iglehart.		1						
St. Albans.	North line of Carroll.		1						
St. Albans.	North line of Anthony.		1						
Sims.	East and			2					
Sims.	West line of Greenbrier.			1					
Sims.	East line of Edgerton.			1					
Sims.	West line of Earl.			1					
Short.	West line of Maria.			1					
Short.	East line of Hoffman.			1					
Snelling.	At Goodrich on H.			1					
Snelling.	At Lincoln on H.			1					
Snelling.	South line of Grand on H.			1					
Snelling.	North and south line of Summit, M and H.			1		2			
Snelling.	South line of Ashland on H.			1					
Snelling.	South line of Hague on H.			1					
Snelling.	South line of Selby on H.			1					
Snelling.	South line of Marshall, M and H.			1		1			
Snelling.	North line of line.					1			
Snelling.	North line of Carroll on H.			1					
Snelling.	North line of St. Anthony on H.			1					
Snelling.	North line of Shields on H.			1					
Snelling.	North and south line of University.					2			
Snelling.	At Edmund on H.			1					
Snelling.	At Blair on H.			1					
Snelling.	North and south line of Minnehaha, M. and H.			1		2			
Snelling.	North line of Capitol on H.			1					
Snelling.	North line of Wesley on H.			1					
Snelling.	South line of Manitoba Ry. on H.			1					
Simpson.	South line of Minnehaha.			1					
Simpson.	South line of Wesley.			1					
Simpson.	South line of Hewitt.			1					
Simpson.	South line of Van Buren.			1					
Sidney.	North line of Ellis.			1					
Sixth.	North line of Summit.			1					
Sixth.	West line of Arcade.			1					
Sixth.	West line of Hope.			1					
Sixth.	West line of Maple.			1					
Sixth.	East and west line of Bates.			2					
Sixth.	West line of Maria.			1					
Scudder.	At Atty on H.			1					

LOCATION OF VALVES (HIGH SERVICE).—Continued.

STREET.	LOCATION.	2-Inch.	4-Inch.	6-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
University..	East line of Aldine on H.....		1							
University..	East line of Wheeler on H.....		1							
University..	East and west line of Fairview, M. and B. O.....		1				2			
University..	East and west line of Prior on M. and H.....		1				1			
University..	East end on H.....			1						
University..	Center of H.....			1						
University..	West line of H.....			2			1			
University..	West line of H.....			3						
University..	West line of H.....			1						
University..	West line of H.....			1						
University..	West line of H.....			1						
University..	West line of H.....			1						
University..	West line of H.....			1						
University..	East and H.....				1		1			
Vandalla....	North line of H.....			1						
Vandalla....	North line of H.....			1						
Valley.....	West line of H.....					1				
Viola.....	West line of H.....			1						
Viola.....	East line of H.....			1						
Viola.....	East line of H.....			1						
Virginia....	North line of Summit.....			1						
Virginia....	South line of Selby.....			1						
Virginia....	North and south line of Dayton.....			2						
Virginia....	North line of Nelson.....		1							
Virginia....	South line of Iglehart.....		1							
Virginia....	North line of Fuller.....		1							
Virginia....	South line of University.....		1							
Virginia....	North line of Thomas.....		1							
Virginia....	North line of H.....		1							
Virginia....	North line of H.....		1							
Virginia....	North line of H.....		1							
Virginia....	South line of H.....		1							
Victoria....	North line of H.....			1		1				
Victoria....	North and H.....					2				
Victoria....	North line of H.....			1						
Victoria....	North and south line of Marshall, M. and H.....			1		2				
Victoria....	North and south line of University.....					2				
Victoria....	North line of Front.....				1					
Van Buren..	West line of Simpson.....			1						
Van Buren..	West line of Western.....			1						
Van Buren..	East line of Mackubin.....			1						
Van Buren..	East and west line of Dale.....			2						
Van Buren..	East line of Grotto.....			1						
Van Buren..	East line of Aldine.....			1						
Van Slyke..	West line of Chatsworth.....			1						
Van Slyke..	West line of Argyle.....			1						
Van Slyke..	West line of Horton.....			1						
Van Slyke..	East line of Lexington.....			1						
Wabasha....	North line of Iglehart.....			1						
Wabasha....	North and south line of Central.....		1	1						
Western....	South line of Holly, M and B. O.....	2			1					
Western....	North and south line of Dayton.....				1		1			
Western....	North line of Round, M and B. O.....	1					1			
Western....	North line of University.....						1			
Western....	B. O., at Sherburne.....	1								
Western....	North line of Lafond.....						1			
Western....	South line of Como.....						1			
Waltham....	East line of Prior.....		1							
Williams....	West line of Olive.....			1						
Wilder.....	North line of Iglehart.....			1						
Wilder.....	South line of Carroll.....			1						
Wilder.....	South line of St. Anthony.....			1						
Whitall....	East and west line of Edgerton.....			2						
Whitall....	East line of Bradley.....			1						
Whitall....	West line of Burr.....			1						
Walker.....	North line of Hewitt.....		1							
Wesley.....	West line of Pasca.....		1							
Wesley.....	West line of Snelling.....			1						
Workhouse..	West line of Lexington.....			1						

LOCATION OF VALVES (LOW SERVICE).—Continued.

STREET.	LOCATION.								
Wheeler St.	East line of Bayliss..								
Westminster	South line of Case.....								
Westminster	South line of York.....								
Wheeler av.	South line of University.....								
Woodbridge.	South line of Front.....								
Winnipeg...	East line of Rice...								
White Bear.	North line of Seventh.....								
White Bear.	South line of Harvester.....								
Wells.....	West line of Greenbrier.....								
Wells.....	East line of Walsh								
Wells.....	West line of Arcade.								
York.....	East and west line of Arcade.....								
York.....	West line of Greenbrier								
York.....	East and west line of Edgerton.....								
York.....	East line of Bradley....								
York.....	East line of Clark								
York.....	East line of Cortland								
	Totals	23	115	1952	1371	67	33	0	5

Number of valves laid this year 20
 Number of valves transferred from low service ... 22
 Total number of valves on high service 1,347

*Two of these are 8-inch blow-offs.

TABLE NO. 15.

LOCATION OF VALVES (LOW SERVICE).

Street.	Location
Alabama....	East line of State ..
Ada	North line of Noble ..
Arbor.....	North line of Jefferson
Armstrong ..	East and west line of
Armstrong....	East and west line of
Audubon.....	East line of Seventh..
Bandl.....	East and west line of
Bandl.....	West line of Western.
Bandl.....	West line of Smith av
Bancroft ..	North line of Winifred
Bancroft ..	North line of Robie...
Bancroft....	North line of Concord
Bay.....	East and west line of
Bay.....	South line of Lee ...
Bay.....	North and south line
Bay	South line of Randolph
Bradley....	North line of Partridge
Bradley ..	North line of North, I
Beaumont ..	East line of De Soto.
Becker p....	South line of Lafayette
Belvidere ..	South line of Concord
Belvidere ..	West line of Waterloo
Bidwell ..	South line of Isabel ..
Broadway..	Union Depot R. R. ya
Broadway..	North and south line
	B. O.
Broadway..	North line of Fifth ..
Broadway..	North line of Sixth, H
Broadway ..	North and south line
	and H.....
Broadway..	At Ninth, B. O.
Broadway..	South line of Tenth, B
Broadway ..	North line of Thirteen
Burr.....	South line of Fauquier
Bruno.....	East line of Lafayette
Brunson....	South line of Hopkins
Brunson....	South line of North, L
Canada.....	North line of Ninth..
Canada	North and south line
Cedar.....	South and north line
Cedar.....	North line of Fifth
Cedar.....	At Sixth, B. O.
Cedar.....	South and North line
Cedar.....	At Eighth, B. O.....
Cedar.....	South line of Tenth ..
Cedar.....	South and north line
Chestnut....	West line of Franklin
Chestnut....	East line of Seventh..
Cliff.....	North line of Goodhue
Clinton....	South line of Congress
Chicago....	East and West line of
College....	West line of Cedar..
College....	West line of Wabasha
College....	West line of St. Peter
College....	South line of Tenth...
Congress ..	West line of Anita...
Congress....	East and west line of
Congress....	East line of Clinton..
Congress ..	East and west line of
Congress ..	East line of Wabasha
Congress....	West line of Goff ..
Congress....	East line of Stryker ..
Congress ..	East line of Winslow...
Congress....	East line of Bellows ..
Concord ..	South line of Isabel ..
Concord ..	East and west line of State
Concord ..	East line of Bancroft...
Concord	West line of Kansas....

LOCATION OF VALVES (LOW SERVICE).—Continued.

STREET.	LOCATION.	2-Inch.	4-Inch.	6-Inch.	8-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
Fifth.....	East line of Wacouta.....					1					
Fifth.....	East 1					1					
Fifth.....	East 1 of Jackson.....					1					
Fifth.....	West					1					
Fifth.....	East 1 of Cedar.....					1					
Fifth.....	West line of Wabasha.....			1							
Fifth.....	West line of St. Peter.....			1							
Fifth.....	West line of Market.....			1							
Fifth.....	West line of Washington.....		1								
Fifth.....	South line of West Seventh.....			1							
Fifth.....	East line of Exchange.....			1							
Fifth.....	East line of Fort.....		1								
Fifth.....	East line of Smith.....		1								
Fifth.....	East line of Third.....			1							
Forbes.....	West line of Wilkin.....			1							
Forbes.....	East and west line of Seventh.....			2							
Forbes.....	West line of Smith.....			1							
Fort.....	North line of Fourth, M. and B. O.....		2					1			
Fort.....	South line of Fifth, H.....		1								
Fort.....	South line of Sixth, H.....		1								
Fort.....	ne of M. and H.....		1					1			
Fort.....	Tenth, H.....		1								
Fourth.....	th R. R., H.....			1							
Fourth.....	of Kittson.....					2					
Fourth.....		1									
Fourth.....	West					1					
Fourth.....	East Broadway.....			1		1					
Fourth.....	West			1							
Fourth.....	West of Wacouta.....			1							
Fourth.....	East and west line of Jackson.....			2							
Fourth.....	East line of Minnesota.....			1							
Fourth.....	East and west line of Cedar.....			2							
Fourth.....	West line of Wabasha.....			1							
Fourth.....	West line of Market.....			1							
Fourth.....	East line of Franklin.....			1							
Fourteenth.....	East and west line of Canada.....			3							
Fourteenth.....	East line of Jackson.....			1							
Garfield.....	North line of Lisbon.....			1							
Garfield.....	North line of Goodrich.....			1							
Grace.....	South line of Seventh.....			1							
George.....	West line of State.....					1					
George.....	West line of Livingston.....					1					
George.....	East line of Stryker.....					1					
Greenwood.....	South line of Congress.....			1							
Glencoe.....	East			1							
Glencoe.....	West			1							
Goff.....				1							
Goodhue.....	East			2							
Goodhue.....	East			1							
Goodrich.....	East M. and B. O.....										
Grove.....	Between Temperance and Canada, H.....	1		1		1					
Grove.....	East line of Jackson.....		1								
Grove.....	Center of Mississippi, M. H. and B. O.....		2					1			
Grove.....	West line of Lafayette.....			1							
Hall.....	South line of Colorado.....			1							
Hall.....	North and south line of Isabel.....			2							
Hall.....	South line of Congress.....			1							
Hall.....	North line of Roble.....			1							
Hall.....	North line of George.....			1							
Harrison.....	West line of Douglas.....			1							
Harrison.....	West line of Garfield.....			1							
Harrison.....	East line of Lawton.....			1							
Hopkins.....	West line of Bradley.....			1							
Hopkins.....	East line of De Soto.....			1							
Isabel.....	West line of State.....					1					
Isabel.....	East and west line of Starkey.....					2					
Isabel.....	West line of Winslow.....					1					
Indiana.....	West line of State.....						1				
Indiana.....	West line of Eaton.....						1				
Indiana.....	East and west line of Starkey.....					1	1				

LOCATION OF VALVES (LOW SERVICE).—Continued.

STREET.		4-inch.	4-inch.	6-inch.	8-inch.	12-inch.	18-inch.	24-inch.	30-inch.	36-inch.
McNeal.....				1						
McNeal.....				1						
McNeal.....				2						
Nash.....				4						
Nell.....			1							
Ninth.....			1							
Ninth.....			1	1						
Ninth.....			1	4						
Ninth.....			1	1						
Ninth.....			1	2						
Ninth.....			1	2						
Ninth.....			1	2						
Ninth.....			1	1						
Ninth.....			1	2						
Ninth.....			1	1						
Ninth.....			1	2						
Norris.....			1	2						
Norris.....			1	1						
Ontario.....			1	1						
Oakdale.....			1	1						
Oakdale.....			1	1						
Onelda.....			1	1						
Onelda.....			1	1						
Overton.....			1	1						
Overton.....	At Como s			1						
Overton.....	1,562 feet			1						
Overton.....	and B. O. Phalen			1						
Overton.....	At pumping station, M. and B. O.			1					1	1
Otsago.....	North line of Lafayette, D. H. and L.			1						
Olive.....	South line of Seventh.....			1						
Olive.....	North and south line of Grove.....		1	1						
Olive.....	North and south line of Olmsted, D.			1						
Olive.....	H and L			2						
Partridge.....	West		1							
Pleasant.....	East			2						
Pleasant.....	North			1						
Pleasant.....	West line of Thompson.....			1						
Pleasant.....	West line of Western.....			1						
Pen'sylv'nia.....				3						
Pen'sylv'nia.....				1						
Prescott.....				1						
Pine.....	North line of		1							
Pine.....	North line of Eighth.....		1							
Pine.....	North line of Ninth.....		1							
Pine.....	North line of Grove.....			1						
Pine.....	North line of Olmsted			1						
Prince.....				1						
Ramsey.....	of Seventh.....					1				
Ramsey.....	West line of Thompson.....			1						
Ramsey.....	South line of Pleasant.....			1						
Randolph.....	East and west line of Seventh.....			1		1				
Randolph.....	East and west line of Victoria.....			1						
Richmond.....	South line of Seventh.....			1						
Rosabel.....	South line of Third.....			1						
Rosabel.....	South line of Fourth.....			1						
Rosabel.....	North and south line of Fifth.....			2						
Rosabel.....	South line of Sixth.....			1						
Rosabel.....	South line of Seventh.....			1						
Robert.....	North and south line of Third.....			2						
Robert.....	North line of Fourth.....			1						
Robert.....	Between Fourth and Fifth, H.....			1						
Robert.....	North line of Fifth.....			1						
Robert.....	Between Sixth and Seventh, H.....			1						
Robert.....	North and south line of Seventh.....			2						
Robert.....	North line of Eighth			1						
Robert.....	North line of Ninth.....			1						
Robert.....	South line of Eleventh.....			1						
Robert.....	North and south line of Twelfth.....			2						
Robert.....	South line of Fourteenth.....			1						
Robert.....	North line of Fairfield.....			1						
Robert.....	North and south line of Indiana.....			2						
Robert.....	South line of Chicago			1						

LOCATION OF VALVES (LOW SERVICE).—Continued.

STREET.	LOCATION.	3-Inch.	4-Inch.	6-Inch.	8-Inch.	12-Inch.	16-Inch.	20-Inch.	24-Inch.	30-Inch.	36-Inch.
Sixth.....	East line of Sibley.....				1						
Sixth.....	East and West line of Jackson.....				2						
Sixth.....	East line of Robert.....				1						
Sixth.....	East line of Minnesota.....				1						
Sixth.....	East and west line of Cedar.....				2						
Sixth.....	West line.....				1						
Sixth.....	East line.....			1							
Sixth.....	South.....			1							
Sixth.....	East line.....			1							
Sixth.....	East line.....			1							
Sixth.....	East and Tenth.....			2							
Sixth.....	North.....			1							
Smith av ..	North.....			1							
Smith av ..	East.....			2							
Smith av ..	North line of Forbes.....			1							
Smith av ..	North line of Ramsey.....			1							
Smith av ..	North line of Sherman.....			1							
Smith av ..	North line of Walnut.....			1							
Smith av ..	North and south line of Third.....			2							
Smith av ..	North line of Sixth.....			1							
Somerset..	East line of Pine.....			1							
Somerset..	West line of John.....			1							
Spruce.....	East line of Broadway.....		2								
Summit....	East line of Minnesota.....			1							
Stryker....	North line of George, D. H. and L.....			2							
Stryker....	North line of Winifred.....			1							
Stryker....	North and south line of Isabel.....			2							
Tenth.....	West line of Locust.....					1					
Tenth.....	West line of Olive.....					1					
Tenth.....	East and west line of Broadway.....			2		3					
Tenth.....	West line of Canada.....					1					
Tenth.....	West line of Sibley.....					1					
Tenth.....	East and west line of Jackson.....		1			1					
Tenth.....	East line of Robert.....			1							
Tenth.....	East and west line of Cedar, M. and H.....		1	1							
Tenth.....	East line of Wabasha, B. O.....		1								
Tenth.....	East line of St. Peter, M. and H.....		1					1			
Tenth.....	East line of Fort.....			1							
Tennessee..	East line of.....			1							
Twelfth....	East line of..... H and B. O.....		2								
Twelfth....	East line of.....		1								
Twelfth....	East line of Minnesota, H.....		1								
Temperance	East line of Eighth.....		1								
Temperance	East line of Tenth.....		1								
Temperance	East and south line of Grove.....		2								
Third.....	East and west line of Broadway.....					2					
Third.....	East line of Wacouta.....					1					
Third.....	East and west line of Jackson.....					2					
Third.....	West line of Minnesota.....					1					
Third.....	East line of St. Peter.....					1					
Third.....	East and west line of Washington.....					2					
Third.....	.....					1					
Third.....	..... L.....			1							
Thirteenth	East and west.....			4							
Thirteenth	East and west line of Canada.....			2							
Thirteenth	East line of Jackson.....			1							
Thompson ..	.....			1							
Toronto.....	East and west..... Seventh.....			2							
Tuscarora ..	West line of Warsaw.....			1							
Tuscarora ..	East and west line of Seventh.....			2							
Tuscarora ..	West line of Victoria.....			1							
Van Slyke et	East line of Broadway.....		2								
View.....	North line of Seventh.....			1							
View.....	South line of Armstrong.....			1							
View.....	South line of Juno.....			1							
View.....	North and south line of Randolph.....			2							
View.....	North line of James.....			1							
Von Minden ..	East line of Western.....			1							
Wabasha.....	North and south line of Third.....			2							
Wabasha.....	North and south line of Fifth.....			2							

TABLE NO. 16.

LOCATION OF VALVES (HIGH SERVICE, WEST ST. PAUL.)

STREET.	LOCATION.	6 inch.	12-inch.	16-inch.
Baker.....	West line of Bidwell.....		1	
Baker.....	West line of Charlton.....		1	
Baker.....	East and west line of Man. min.....		2	
Baker.....	East line of Cherokee.....		1	
Belvidere...	East line of Robert.....	1		
Bidwell....	South line of Baker.....			1
Hunker....	West line of Mt. Hope.....	1		
Cherokee....	South line of Winona.....	1		
Cherokee....	North line of Belmont.....	1		
Cherokee....	North line of Page.....	1		
Cherokee....	North and south line of Baker...	2		
Cherokee....	North line of Stevens.....	1		

this year, 2. Total number of valves on ~~high~~
 53. Total number of valves on high, low and high

main; B. O., blow-off; H., on hydrant; H. B. on hydrant
 and L., dividing between high and low service; B. W., by-way;
 C. V., check valve; R. V., relief valve; M. H., manhole.

LIST OF HY

LOCATION.						Single or Double Steamer.	Size of Street Main.
Peter, n. e. cor.....	34					D.	16
Abasha, n. w. cor.....	35					D.	16
North, n. w. cor.....	41					S.	12
Minnesota, n. w. cor.....	44					S.	16
Robert, n. w. cor.....	45					D.	16
Seventh, n. e. cor.....	42					D.	12
	45					D.	16
	44					D.	16
Mabel, n. w. cor.....	44					D.	16
Seventh, s. w. cor.....	44					S.	16
Ne. s. w. cor.....	40					D.	16
	40					D.	16
	42					D.	16
Must, s. w. cor.....	43					D.	16
Sill, s. e. cor.....	46					S.	6
North, n. e. cor.....	47					S.	4
	41					S.	4
Minnesota, n. e. cor.....	46					D.	12
	46					R.	6
Minnesota, s. e. cor.....	44					S.	6
Abasha, n. w. cor.....	31					S.	6
	32					S.	6
	34					S.	6
of Fifth, s. w. cor.....	42					D.	12
	44					S.	12
	46					S.	6
	47					D.	12
	54					S.	6
	52					D.	12
Robert, n. w. cor.....	46					S.	6
Minnesota, n. w. cor.....	45					S.	6
Abasha, n. w. cor.....	32					S.	6
	33					S.	12
	35					S.	12
	35					S.	12
Franklin, n. e. cor.....	34					S.	12
Harrison, n. e. cor.....	34					S.	12
Ket, n. e. cor.....	33					S.	12
of Eagle, n. w. cor.....	44					S.	4
Peter, n. e. cor.....	33					S.	12
Third, n. w. cor.....	33					S.	6
Id, n. w. cor.....	33					S.	12
Minnesota, n. e. cor.....	40					D.	12
Robert, n. w. cor.....	47					D.	12
son, s. e. cor.....	54					S.	12
106 Sibley and Third, s. w. cor.....	62					D.	6
107 Jackson and Levee, n. e. cor.....	67					S.	6
108 Jackson and Tenth, n. e. cor.....	31					S.	12
109 Jackson and Eleventh.....	30					S.	12
110 N.W. 1	69					S.	4
111	33					S.	6
112 Ninth and Robert, n. e. cor.....	32					S.	6
113 Tenth and Wacouta, n. w. cor.....	38					S.	12
114 Mississippi and Nash, n. w. cor.....	35					S.	6
115 Broadway and Twelfth.....	40					S.	6
116	40					S.	6
117	37					S.	4
118	32					S.	6
119	32					S.	6
120	43					D.	6
121	33					S.	6
122 Seventh and Letch, s. w. cor.....	35					S.	12

LIST OF

No.				High Service.		Single or Double Steamer.	Size of Street Main.
				East Side.	West Side.		
				48		8	6
				51		8	6
				52		8	6
				53		8	6
				48		8	6
				37		8	6
			cor.	30		8	6
				30		8	6
				24		8	6
197	Jackson and		cor.	34		8	6
198	Jackson and		cor.	31		8	6
199				36		8	6
200			cor.	65		8	6
201			cor.	35		8	12
202			n. e. cor.	48		8	12
203			n. e. cor.	62		8	12
204	Fifth and		cor.	63		8	12
205	Sixth and		cor.	60		10	6
206	Tenth and		cor.	27		8	6
207	Tenth and		cor.	26		8	6
208	Jackson		cor.	23		8	6
209	Cedar and Eighth, n. w. cor.			40		8	12
210	Cedar and Exchange, n. w. cor.			32		8	12
211	Ninth and Minnesota, n. e. cor.			34		8	6
212			n. w. cor.	37		8	6
213			n. e. cor.	50		8	6
214	Kittson and Fifth, n. w. cor.			54		8	6
215	Kittson and Sixth, n. w. cor.			53		8	6
216	Sixth and Nell, s. e. cor.			50		8	6
217			cor.		72	8	6
218	Bradley and			38		8	6
219	Bradley and			31		8	6
				33		8	6
			l. s. w. cor.	34		8	6
			w. cor.		84	8	6
			s. w. cor.		77	8	6
			s. w. cor.	34		8	6
			n. w. cor.	35		8	6
			s. n. w. cor.	34		8	6
				39		8	6
227						8	6
228			n. w. cor.	37		8	4
229			n. w. cor.		82	8	6
230	Beaumont and De Soto, n. e. cor.				81	8	6
231	Burr and Beaumont, n. w. cor.				79	8	6
232	Burr and				75	8	6
233	Burr and				83	8	6
234			Seventh st., s. w. cor.	34		8	6
235	Fourth and Pine, n. e. cor.			50		8	12
236	Fourth and Olive, n. w. cor.			64		8	12
237	Forbes and Seventh, n. e. cor.			34		8	6
238	Fourth and Exchange, n. e. cor.			34		8	6
239	McNeal and Seventh, n. e. cor.			33		8	6
240	St. Peter and Sixth, s. w. cor.			23		8	6
241	Prince and Pine, n. w. cor.			65		8	6
242	Prince and Olive			65		8	6
243	Prince and John			66		8	6
244	Mt. Airy and L'Orient, n. e. cor.			21		8	6
245	Smith avenue and			31		8	6
246	Smith avenue and			20		8	6
247	Smith avenue and College, s. w. cor.			16		8	6
248	Douglas and Seventh, s. w. cor.			34		8	6
249	Goodrich and Seventh, n. e. cor.			34		8	6
250	Goodrich and Smith avenue, n. e. cor.			28		8	6

LIST OF HYDRANTS.—Continued.

No.	LOCATION.	STATIC PRESS				
		Low Service. Ht.				
		Sholen Lake.	Vadna's Lake.	Rever-		
316	Nina and Laurel n. w. cor.			32	8.	6
316	Westminster, 200 feet south of G. N. Ry.	27			8.	6
317	Thirteenth and Broadway, n. w. cor.		39		8.	6
318	Temperance and Norris, n. e. cor.	34			8.	4
319	Bansil and Seventh, n. e. cor.		33		8.	4
320	Goodhue and Seventh, n. e. cor.		33		8.	4
321	Yankee and Seventh, n. e. cor.		34		8.	4
322	Western and Seventh, s. w. cor.		35		8.	6
323	St. Clair and Seventh, n. e. cor.		34		8.	6
324	Richmond and Seventh, s. w. cor.		34		8.	6
325	Seventh and Colborne, s. e. cor.		36		8.	16
326	Chestnut and Franklin, n. w. cor.		52		8.	6
327	Twelfth and Jackson, n. w. cor.		32		8.	20
328	Twelfth and Minnesota, n. w. cor.		29		8.	20
329	Twelfth and Cedar, n. e. cor.		27		8.	20
330	Cedar and Summit, s. w. cor.		23		8.	6
331	Chestnut and Washington, n. w. cor.		62		8.	6
332	Laurel and Virginia, n. w. cor.			32	8.	6
333	Selby and Virginia, n. w. cor.			32	8.	6
334	Mackubin and Laurel, s. w. cor.			30	8.	6
335	Portland and Arundel, n. e. cor.			32	8.	6
336	Portland and Mackubin, n. e. cor.			29	8.	6
337	Portland and Kent, n. e. cor.			34	8.	6
338	Portland and Dale, n. e. cor.			34	8.	6
339	Selby and Arundel, n. e. cor.			33	8.	6
340	Selby and Mackubin, n. e. cor.			29	8.	6
341	Selby and Kent, n. e. cor.			29	8.	6
342	Selby and Dale, n. e. cor.			31	8.	6
343	Carroll and Arundel, n. w. cor.			36	8.	6
344	Carroll and Mackubin, n. e. cor.			34	8.	6
345	Carroll and Kent, n. e. cor.			30	8.	6
346	Kent and Iglehart, n. w. cor.			29	8.	4
347	Marshall and Dale, n. e. cor.			31	8.	6
348	Marshall and Kent, n. e. cor.			27	8.	6
349	Marshall and Mackubin, n. w. cor.			31	8.	6
350	Rondo and Arundel, n. w. cor.			55	8.	6
351	Rondo and Mackubin, n. e. cor.			42	8.	6
352	Iglehart and Arundel, n. w. cor.			31	8.	6
353	Iglehart and Mackubin, n. e. cor.			33	8.	6
354	Marshall and Arundel, n. w. cor.			31	8.	6
355	McBoal and Douglas, n. e. cor.		33		8.	6
356	Douglas and Harrison, n. w. cor.		33		8.	6
357	Summit and Third			50	8.	12
358	Summit and Nelson, n. w. cor.			52	8.	12
359	College and Sixth, s. e. cor.			70	8.	6
360	Nelson and Virginia, n. w. cor.			30	8.	6
361	Nelson and Farrington, n. w. cor.			31	8.	6
362	Nelson and Louis, n. w. cor.			43	8.	6
363	Nelson and Summit place, n. w. cor.			43	8.	6
364	Carroll and Virginia, n. w. cor.			48	8.	6
365	Carroll and Farrington, n. e. cor.			50	8.	6
366	Carroll and Louis, n. w. cor.			56	8.	6
367	Carroll and Summit place, n. w. cor.			60	8.	6
368	Carroll and Ravoux, n. e. cor.			63	8.	6
369	Park place Park			67	8.	4
370	Iglehart and Virginia, n. w. cor.			39	8.	6
371	Iglehart and Farrington, n. w. cor.			40	8.	6
372	Iglehart and Louis, n. w. cor.			50	8.	6
373	Douglas and Lisbon, n. w. cor.		35		8.	6
374	Iglehart and St. Peter, n. w. cor.			65	8.	6
375	Iglehart and Wabasha, n. w. cor.			72	8.	6
376	Iglehart and Summit place, n. e. cor.			54	8.	6
377	Iglehart and Ravoux, n. e. cor.			63	8.	6
378	Iglehart and Rice, n. w. cor.			68	8.	6

LIST OF

No.				High Service.		Single or Double Steamer.	Size of Street Main.
				Water Side.	West Side.		
443	Bates and Ravine, n. w. cor.			50		8.	12
	and Conway, n. w. cor.			50		8.	12
	and Third, n. w. cor.			52		8.	12
	and Fourth, n. w. cor.			50		8.	12
	and Fifth, n. w. cor.			57		8.	12
	and Sixth, n. w. cor.			55		8.	12
	and Seventh, s. w. cor.			60		8.	12
	and Maple, n. w. cor.			44		8.	6
	and Maple, n. w. cor.			46		8.	6
	Maple, n. w. cor.			47		8.	6
	Canada.			75		8.	16
	and Maple, n. e. cor.			44		8.	16
455	Seventh and Hope, n. w. cor.			40		8.	16
456	Seventh and Margaret, n. e. cor.			42		8.	16
457	Seventh and Beech, n. e. cor.			44		8.	16
458	Goodhue and		40			8.	6
459	Goodhue and		30			8.	6
460	Grace and		38			8.	6
461	Colborne		34			8.	6
462	Duke and		35			8.	6
463	Seventh and			55		8.	16
464	Seventh and Heaney, n. w. cor.			52		8.	16
465	Seventh and Forest, n. w. cor.			52		8.	16
466	Nash and L'Orlent, n. e. cor.		37			8.	6
467	Jessie and Fauquier, s. w. cor.			81		8.	6
468	Seventh and Erie, s. e. cor.		36			8.	16
469	Seventh and Fauquier, n. w. cor.			50		8.	16
470	Seventh and Cypress, n. e. cor.			60		8.	16
471	Seventh and Ross, n. w. cor.			62		8.	16
472	Seventh and Earl, n. w. cor.			64		8.	16
473	Ross and Earl, n. w. cor.			50		8.	6
474	Edmund and Marion, n. e. cor.			54		8.	6
475	Fauquier and Cypress, n. e. cor.			57		8.	6
476	Fauquier and Earl, n. w. cor.			56		8.	6
477	Fauquier and		7			8.	12
478	Fauquier and Edgerton, s. e. cor.		16			8.	12
479	Fauquier and Bradley, s. w. cor.		19			8.	12
480	De Soto and Fauquier, s. w. cor.		21			8.	12
481	De Soto and Minnehaha, n. w. cor.		10			8.	12
482	Fifth, 350 feet west of Marlin			73		8.	6
483	Fauquier and Forest, n. w. cor.			55		8.	6
484	Fauquier and Mendota, n. e. cor.			63		8.	6
485	Fauquier and Arcade, n. e. cor.			61		8.	6
486	Lincoln, betw			59		8.	6
487	cor			54		8.	6
488	&			53		8.	6
489	Conway, n. w. cor.			50		8.	6
490	Conway, n. w. cor.		41			8.	6
491	Onelda and Seventh, s. w. cor.		30			8.	6
492	Franklin and Fifth, n. w. cor.		33			8.	4
493	Van Slyke place and Olive, s. w. cor.		38			8.	4
494	Martin and Arundel, s. e. cor.			48		8.	6
495	Lincoln and St. Albans, n. e. cor.			30		8.	6
496	Lincoln and Grofte, n. e. cor.			33		8.	6
497	Lincoln and Avon, n. e. cor.			37		8.	6
498	Fuller and Arundel, n. e. cor.			46		8.	6
499	Fuller and			43		8.	6
500	Fuller and			40		8.	6
501	Goodhue and		23			8.	6
502	Goodhue and		22			8.	6
503	Goodhue and		31			8.	6
504	Portland and			25		8.	6
505	Aurora and			46		8.	6
506	Aurora and Mackubin, n. w. cor.			44		8.	6
507	Aurora and Arundel, n. w. cor.			50		8.	6

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LIST OF HYDRANTS.—Continued.

No.	LOCATION.		High Service.		Single or Double Steamer.	Size of Street Main.
			Volts.	West Side.		
573	Kittson and Fourth, n. w. cor.	65			3.	6
574	Valley and Warren, n. e. cor.		51		3.	16
575	Fairview and Valley, n. w. cor.		50		3.	6
576	Mendota and Dawson, n. w. cor.		44		3.	12
577	Mendota and Francis, n. w. cor.		40		3.	12
578	Mendota and Fourth, n. w. cor.		46		3.	12
579	Mt. Airy and Broadway, n. w. cor.		50		3.	6
580	Fourth and Neill, n. e. cor.	67			3.	12
581	Fourth and Willis, n. e. cor.	66			3.	12
582	Fourth and Locust, n. e. cor.	66			3.	12
583	Fourth and Locust, n. w. cor.		50		3.	12
584	Fourth and Locust, n. w. cor.		53		3.	12
585	Fourth and Locust, n. e. cor.		57		3.	6
586	Fourth and Locust, n. e. cor.		56		3.	6
587	Fourth and Locust, n. e. cor.		47		3.	6
588	Fourth and Locust, n. e. cor.		60		3.	6
589	Fourth and Locust, n. e. cor.		52		3.	6
590	Fourth and Locust, n. e. cor.		44		3.	6
591	Fourth and Locust, n. e. cor.		49		3.	12
592	Fourth and Locust, n. e. cor.		40		3.	6
593	Fourth and Locust, n. e. cor.		38		3.	6
594	Fourth and Locust, n. e. cor.		48		3.	6
595	Fourth and Locust, n. e. cor.		55		3.	6
596	Fourth and Locust, n. e. cor.	34			3.	6
597	Fourth and Locust, n. e. cor.		50		3.	6
598	Fourth and Locust, n. e. cor.	61			3.	12
599	Fourth and Locust, n. e. cor.		49		3.	6
600	Fourth and Locust, n. e. cor.		38		3.	6
601	Fourth and Locust, n. e. cor.		41		3.	6
602	Fourth and Locust, n. e. cor.		56		3.	6
603	Fourth and Locust, n. e. cor.		50		3.	6
604	Fourth and Locust, n. e. cor.		41		3.	6
605	Fourth and Locust, n. e. cor.		62		3.	6
606	Fourth and Locust, n. e. cor.		54		3.	6
607	Fourth and Locust, n. e. cor.		60		3.	6
608	Fourth and Locust, n. e. cor.		63		3.	6
609	Fourth and Locust, n. e. cor.		74		3.	6
610	Fourth and Locust, n. e. cor.		49		3.	6
611	Sherburne and Gaultier, n. w. cor.		68		3.	6
612	Sherburne and Farrington, n. e. cor.		67		3.	6
613	Sherburne and Virginia, n. w. cor.		67		3.	6
614	Sherburne and Virginia, n. w. cor.		46		3.	6
615	Sherburne and Virginia, n. w. cor.		63		3.	6
616	Sherburne and Virginia, n. w. cor.	30			3.	6
617	Mississippi and Jenks, n. w. cor.	28			3.	6
618	Mississippi and Jenks, n. w. cor.	27			3.	6
619	Mississippi and Jenks, n. w. cor.	24			3.	6
620	Mississippi and Magnolia, s. w. cor.	20			3.	6
621	Mississippi and Jessamine, s. w. cor.	20			3.	6
622	Robert and Thirteenth, s. e. cor.	20			3.	6
623	Capitol and Buffalo, n. s. cor.		64		3.	6
624	Capitol and Elk, n. e. cor.		67		3.	6
625	Capitol and Cortland, n. e. cor.		66		3.	6
626	University and Mackubin, n. e. cor.		51		3.	12
627	University and Kent, n. e. cor.		48		3.	12
628	University and Dale, n. e. cor.		46		3.	12
629	Central avenue, north of Central Park.		73		3.	6
630	Central Drive, n. e. cor.		84		3.	6
631	Genesee and Buffalo, n. e. cor.		65		3.	6
632	Sherburne and Western, n. w. cor.		56		3.	6
633	Sherburne and Arundel, n. w. cor.		57		3.	6
634	Sherburne and Mackubin, n. w. cor.		53		3.	6
635	Sherburne and Kent, n. w. cor.		49		3.	6
636	Aurora and Virginia, n. w. cor.		56		3.	6
637	Fourteenth and Robert, n. e. cor.	30			3.	6

LIST OF HYDRANTS.—Continued.

740 Arcade and Jinks, s. w. cor	40	S.	12
741 Arcade and Lawson, s. w. cor	45	S.	12
742 Arcade and Cook, s. w. cor	42	S.	12
743 Arcade and Magnolia, s. w. cor	48	S.	12
744 Arcade, in front of Bohn Mfg Co.	40	D.	12
745 Fauquier and Weide, n. e. cor	58	S.	6
746 Reaney and Weide, n. e. cor	43	S.	6
747 Reaney and Arcade, n. e. cor	58	S.	6
748 Edgund and Gaultier, n. e. cor	57	S.	6
749 Edmund and Wifolt, n. e. cor	50	S.	6
750 Edmund and Farrington, n. e. cor	55	S.	6
751 Edmund and Virginia, n. e. cor	55	S.	6
752 Edmund and Western, n. e. cor	50	S.	6
753 Como and Thomas, s. e. cor	46	S.	20
754 Como and Claghorn, s. e. cor	54	S.	20
755 Como and Lafond, s. e. cor	50	S.	20
756 Como and Gaultier, s. e. cor	61	S.	20
757 Aurora and Marion, n. e. cor	59	S.	6
758 Aurora and Jay, n. e. cor	57	S.	6
759 Aurora and Farrington, n. e. cor	59	S.	6
760 Preble and Minnehaha, s. w. cor	80	S.	6
761 Payne and Beaumont	85	S.	6
762 Thomas and Arundel, n. e. cor	58	S.	6
763 Thomas and Mackubin, n. e. cor	57	S.	6
764 Conway and Arcade, n. e. cor	40	S.	6
765 Conway and Forest, n. e. cor	51	S.	6
766 Thomas and Kent, n. e. cor	52	S.	6
767 Thomas and Dale, n. e. cor	47	S.	6

LIST OF HYDRANTS.—Continued.

1. 1. 1. 1.

2. 2. 2. 2.

3. 3. 3. 3.

4. 4. 4. 4.

5. 5. 5. 5.

6. 6. 6. 6.

LIST OF HYDRANTS.—Continued.

No.	LOCATION.				
964	Randolph and Fulton, n. e. cor.....				
965	Randolph and Clifton, n. e. cor.....				
966	Randolph and Victoria, n. w. cor.....				
967	Randolph and Milton, n. e. cor.....				
968	Lafond and Kent, n. e. cor.....				
969	Lafond and Dale, n. e. cor.....				
970	Eagle and West Seventh, s. w. cor.....				
971	Edmund and Arundel, n. w. cor.....				
972	Edmund and Mackubin, n. e. cor.....				
973	Edmund and Kent, n. e. cor.....				
974	Edmund and Dale, n. e. cor.....				
975	Case and Forest, n. w. cor.....				
976	Case and Menloia, n. w. cor.....				
977	Colborne and St. Clair, n. w. cor.....				
978	Case and Welde, n. w. cor.....				
979	Case and Walsh, n. w. cor.....				
980	Aurora and Dale, n. w. cor.....				
981	Fuller and Dale, n. w. cor.....				
982	Rondo and Dale, n. e. cor.....		42	S.	6
983	Payne and Case, n. w. cor.....		39	S.	6
984	Payne and Jenks, n. w. cor.....		66	S.	6
985	Payne and Lawson, n. w. cor.....		65	S.	6
986	Cook and Payne, n. e. cor.....		64	S.	6
987	Case and Greenbrier, n. w. cor.....		61	S.	6
988	Case and Edgerton, n. e. cor.....		50	S.	12
989	Martin and Dale, n. e. cor.....		73	S.	12
990	Colborne and Superior, s. w. cor.....	32	40	S.	6
991	Colborne and Michigan, s. w. cor.....	32		S.	6
992	Case and Jessie, n. e. cor.....		73	S.	12
993	Case and Bradley, n. e. cor.....		67	S.	12
994	Case and Burr, n. e. cor.....		66	S.	12
995	Case and De Soto, n. w. cor.....		64	S.	12
996	Case and Arkwright, n. w. cor.....		60	S.	12
997	Case and McMenemy, n. e. cor.....		62	S.	12
998	Burr and Jenks, s. w. cor.....		66	S.	6
999	Burr and York, n. w. cor.....		63	S.	6
1000	Burr and Whittall, n. w. cor.....		60	S.	6
1001	Burr and Omaha railway, n. w. cor.....		66	S.	6
1002	Charles and Mackubin, n. w. cor.....		65	S.	6
1003	Charles and Kent, n. w. cor.....		60	S.	6
1004	Charles and Dale, n. e. cor.....		48	S.	6
1005	Charles and St. Albans, n. e. cor.....		47	S.	6
1006	Edmund and St. Albans, n. e. cor.....		48	S.	6
1007	Edmund and Grotto, n. e. cor.....		50	S.	6
1008	Lafond and St. Albans, n. e. cor.....		48	S.	6
1009	Lafond and Grotto, n. e. cor.....		51	S.	6
1010	Van Buren and Dale, n. w. cor.....		54	S.	6
1011	Minnehaha and Dale, n. w. cor.....		54	S.	6
1012	Payne and Omaha railway.....		63	S.	6
1013	Payne and Ross, n. w. cor.....		65	S.	6
1014	Payne and Whittall, n. w. cor.....		63	S.	6
1015	Payne and Wells, n. w. cor.....		61	S.	4
1016	York and Edgerton, n. e. cor.....		75	S.	6
1017	York and Payne, n. w. cor.....		62	S.	6
1018	York and Greenbrier, n. w. cor.....		48	S.	6
1019	Sims and Greenbrier, n. w. cor.....		49	S.	6
1020	Sims and Payne, n. e. cor.....		64	S.	6
1021	Tuscarora and West Seventh, n. e. cor.....	33		S.	6
1022	Sims and Welde, n. w. cor.....		35	S.	6
1023	Sims and Walsh, n. w. cor.....		41	S.	6
1024	York and Welde, n. w. cor.....		33	S.	6
1025	York and Walsh, n. w. cor.....		40	S.	6
1026	University and St. Albans, n. e. cor.....		48	S.	20
1027	University and Grotto, n. e. cor.....		47	S.	20
1028	University and Avon, n. e. cor.....		47	S.	20

LIST OF HYDRA

No.	LOCATION.	In	Ft.	High Service.		Single or Double Steamer.	Size of Street Main.
				Volts.	West Side.		
1004	St. Anthony and Ferdinand, n. w. cor.	...	...	36	...	B.	8
1005	St. Anthony and Howell	...	...	37	...	B.	8
1006	St. Anthony and Prior, n. w. cor.	...	...	34	...	B.	8
1097	St. Anthony and Merriam place, n. w. cor.	...	...	35	...	B.	8
1098	St. Anthony and Astoria, n. e. cor.	...	...	36	...	B.	8
1099	St. Anthony and Cleveland, n. e. cor.	...	...	34	...	B.	8
1100	Rondo and	...	...	32	...	B.	8
1101	Rondo and	...	...	35	...	B.	8
1102	Rondo and Howell, n. e. cor.	...	...	30	...	B.	8
1103	Rondo and Prior, n. e. cor.	...	...	24	...	B.	8
1104	Rondo and Terrace Park avenue, n. s. cor.	...	...	30	...	B.	8
1105	Carroll and Fairview, n. e. cor.	...	...	33	...	B.	8
1106	Carroll and Laura, n. e. cor.	...	...	35	...	B.	8
1107	Carroll and	...	...	30	...	B.	8
1108	Carroll and Howell, n. e. cor.	...	...	37	...	B.	8
1109	Carroll and Prior, n. e. cor.	...	...	45	...	B.	8
1110	Carroll and Moore, n. e. cor.	...	...	40	...	B.	8
1111	Carroll and Wilder, n. e. cor.	...	...	39	...	B.	8
1112	Carroll and Cleveland, n. e. cor.	...	...	34	...	B.	8
1113	Iglehart and Cleveland, n. e. cor.	...	...	44	...	B.	8
1114	Iglehart and Wilder, n. w. cor.	...	...	43	...	B.	8
1115	Iglehart and Moore, n. e. cor.	...	...	41	...	B.	8
1116	Iglehart and Prior, n. e. cor.	...	...	37	...	B.	8
1117	Iglehart and Howell, n. e. cor.	...	...	36	...	B.	8
1118	Iglehart and Laura, n. w. cor.	...	...	39	...	B.	8
	Carroll, n. w. cor.	...	...	39	...	B.	8
	cor.	...	...	37	...	B.	8
	w. cor.	...	...	63	...	B.	8
	cor.	...	...	76	...	B.	8
	n. w. cor.	...	...	47	...	B.	8
	n. e. cor.	...	...	40	...	B.	12
1	n. e. cor.	...	...	42	...	B.	12
1	n. w. cor.	54	...	...	...	D.	6
1	Marshall, n. w. cor.	...	...	39	...	B.	12
1124	Chicago and Starkey, n. w. cor.	69	...	...	...	B.	8
1129	Chicago and Custer, n. w. cor.	60	...	...	...	B.	8
	cor.	40	...	...	...	B.	8
	w. cor.	57	...	...	...	B.	8
	cor.	...	...	35	...	B.	8
	w. cor.	...	...	72	...	B.	8
	of Maria	...	...	63	...	B.	8
	cor.	38	...	...	...	D.	12
	n. e. cor.	32	...	...	...	D.	8
	age, south side	35	...	...	...	D.	12
		34	...	...	...	D.	12
		34	...	...	...	D.	12
		33	...	...	...	D.	12
	er, south side	33	...	...	...	D.	12
	n. e. cor.	33	...	...	...	D.	12
	n. w. cor.	34	...	...	...	D.	12
	n. w. cor.	20	...	...	...	B.	6
	w. cor.	21	...	...	...	B.	8
	n. w. cor.	...	...	58	...	B.	12
	ston, n. w. cor.	...	...	58	...	B.	8
	in, n. w. cor.	...	...	60	...	B.	8
	n. w. cor.	20	...	...	...	B.	12
	n. w. cor.	22	...	...	...	B.	12
	r, n. e. cor.	23	...	...	...	B.	12
	n. w. cor.	17	...	...	...	B.	12
1153	Stryker and Winifred, n. w. cor.	15	...	...	...	B.	12
1154	Stryker and Congress, n. w. cor.	22	...	...	...	B.	6
1155	Stryker and Delos, s. w. cor.	26	...	...	...	B.	8
1156	Stryker and Colorado, s. w. cor.	22	...	...	...	B.	8
1157	Stryker and Prospect Terrace, s. w. cor.	21	...	...	...	B.	8
1158	Sherburne and St. Albans, n. e. cor.	...	...	46	...	B.	8

LIST OF

				Single or Double Steamer.	Size of Street Main.
OF.....			30		
.....			26		
. COR.....			26		
. COR.....			26		
W. COR.....			27		
.....			27		
N. W. COR.....			26		12
N. W. COR.....			27		12
I. W. COR.....			27		12
S. W. COR.....			26		12
N. W. COR.....			26		12
F. COR.....		59			
COR.....			67		
. COR.....		32	65		
.....			63		
COR.....			60		
COR.....			40		
F. COR.....			46		
.....			36		
OF.....			41		12
OF.....			43		12
F.....			37		12
OF.....			33		12
F.....			33		12
e COR.....			31		12
COR.....			30		12
COR.....			30		12
COR.....			32		12
S. COR.....			34		12
.....			54		16
.....			54		16
.....			58		16
.....			57		6
.....			51		6
.....			72		4
.....			55		6
.....			56		6
.....			58		6
Co.....			52		24
COR.....			43		6
COR.....			44		6
.....			76		6
COR.....		33			6
W. COR.....		33			6
e COR.....			28		16
.....		47			12
.....		40			12
.....		46			6
.....			53		12
.....			49		6
.....			48		6
I. COR.....			58		6
I. e COR.....			47		6
S. COR.....			39		6
I. W. COR.....			44		6
W. COR.....			46		6
3 Sixth.....		48			6
N. W. COR.....			48		6
W COR.....			45		6
W COR.....			46		6
and Arch, S. W. COR.....		80			6
and Pennsylvania, N. W. COR.....		32			6
Mendota, N. W. COR.....			50		6
Edgerton, N. E. COR.....			74		6

LIST OF HY

No.	LOCATION.	Low Service.		High Service.		Single or Double Steamer.	Size of Street Main.
		Phalen Lake.	Vadna's Lake.	Reser- voir.	West Side.		
				57		23	6
OF			23			23	6
			20			23	6
OF			13			23	6
				43		23	6
				55		23	6
				45		23	6
				45		23	6
				47		23	6
				40		23	6
				48		23	6
				40		23	6
				47		23	6
				48		23	6
				34		23	16
				46		23	6
				49		23	6
				45		23	6
				32		23	16
				26		23	16
				27		23	16
				26		23	16
				22		23	16
				19		23	16
				17		23	16
				16		23	16
				30		23	4
				47		23	6
				45		23	6
				44		23	6
				39		23	6
				42		23	6
				56		23	6
				43		23	6
				39		23	6
				34		23	6
				31		23	16
				37		23	6
				66		23	6
				56		23	6
				60		23	6
				65		23	6
				66		23	6
				39		23	6
				48		23	6
			29			23	6
				52		23	6
				43		23	6
				63		23	6
				61		23	6
				44		23	12
			32			23	4
				42		23	6
				40		23	6
				34		23	6
				34		23	6
				41		23	6
				48		23	6
				58		23	6
				41		23	6
				42		23	6
				34		23	6
				39		23	6
			30			23	6
				34		23	6

LIST OF

[illegible]

LIST OF

No.	LOCATION.	High Service.		Single or Double Steamer.	Size of Street Main.
		West Side.	East Side.		
	nd Chicago, St. P. & Omaha Ry	56			12
	nd Stillwater, s. w. cor.	35			12
	cor.	55			12
	and Frank, n. w. cor.	58			12
	and Gotzian	63			0
	nd Wheeler, n. w. cor.	49			0
	nd	32			0
	nd	57			0
	nd	59			10
	Lawson, n. w. cor.	60			10
	Cook, n. w. cor.	50			10
	Olive, n. w. cor.	57			10
	Rice, n. e. cor.	59			0
	Park avenue, n. w. cor.	56			0
	Sylvan, n. w. cor.	61			0
	and Forest, n. w. cor.	57			12
	Lytton	64			10
	Wayzata, s. w. cor.	61			10
	and Rice, n. e. cor.	61			0
	and Park, n. w. cor.	56			0
	and Sylvan, n. w. cor.	50			0
	1 Chatsworth, n. e. cor.	49			0
	1 Oxford, n. e. cor.	50			0
	0 feet west of Oxford.	49			0
	and Cypress, n. e. cor.	54			12
	and Earl, n. e. cor.	51			12
	and Frank, n. w. cor.	56			12
	Pacific, n. w. cor.	50			12
	nd Rice, n. e. cor.	63			0
	nd Park, n. w. cor.	62			0
	nd Sylvan, n. w. cor.	59			0
	McLean, n. w. cor.	47			12
	Suburban, n. w. cor.	46			12
	and Rice, n. e. cor.	63			12
	and Park, n. e. cor.	65			12
	and Sylvan, n. w. cor.	61			12
	and Lightner, s. w. cor.	64			12
	and Jackson, s. w. cor.	66			12
	and Courtland, s. w. cor.	66			12
	nd w. cor.	73			0
	under bridge, at roundhouse.	69			12
	under bridge, at roundhouse.	69			12
	north line of G. N. Ry, n. w. cor.	60			12
	nd Capitol, n. w. cor.	63			12
	n. e. cor.	44			0
	s. w. cor.	78			0
	e. cor.	66			0
	nd	62			0
	nd	66			0
	s. w. cor.	34			0
	e. cor.	34			0
	w. cor.	37			0
	n. w. cor.	35			0
	w. cor.	58			0
	nd	50			0
	nd	32			0
	nd	30			0
	nd	50			0
	nd Thorn	46			0
	45 feet west of Earl	34			0
	and Agate, n. e. cor.	66			10
	and York, n. e. cor.	61			10
	1670 Courtland and Poplar, n. e. cor.	63			10
	1677 Hall and Colorado, s. w. cor.	21			0
	1678 Hall and Prospect terrace, s. w. cor.	22			0

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LIST OF

					Single or Double Steamer.	Size of Street Main.
cor.		19				
bl.		88	80			
of.		29				
		28				
cor.		27				
		33				
		32				
		34				
		85				
Ry.		70	60			12 4
			62			
			60			
cor.			64			
			46			
			64			
cor.			46			
			39			
			39			
		59				12
			29			
			32			
			33			
cor.			33			
or.			32			
or.			30			
		52				12
Wacouta.		51				12
		49				
			28			4
			30			
			28			
cor.			37			
cor.			39			
birth.		56				
cor.			57			
			42			
			48			
cor.			47			
cor.			37			
cor.			44			
or.			46			
or.			45			
w cor.			44			
cor.			36			
		35				
		33				
		31				
			63			
lway.		50				
			49			
		49				12
			34			
cor.			32			
it			49			
		69				12
cor.			59			
			41			
			53			
		67				12
rtia		68				12
		69				12
or.		66				12

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LIST OF HYDRAN

No.	LOCATION.	In Service.		Single or Double Steamer.	Size of Street Main.
		Year.	West Side.		
		85		8	12
		28		8	12
		20		8	12
	enth.	40		8	6
	of	19		8	6
	cor.		24	8	12
	or		21	8	12
			23	8	12
	or		23	8	6
	halfway		30	8	6
			24	8	6
			24	8	6
			72	8	6
	or		55	8	6
	n w cor.		42	8	6
	w. cor.		50	8	12
	cor		10	8	12
	v. cor		20	8	12
	v. cor		22	8	12
			19	8	12
	was in service in				
			18	8	12
	cor.		28	8	6
	v. cor.		34	8	6
			92	8	12
			81	8	6
			79	8	6
	or		87	8	6
	or		82	8	6
			86	8	6
			81	8	6
			86	8	12
	cor		75	8	12
			74	8	12
			73	8	12
	or		74	8	12
			86	8	12
			85	8	12
			74	8	12
			02	8	6
			03	8	6
			75	8	6
			79	8	6
			74	8	6
			77	8	6
			78	8	6
			77	8	12
			75	8	12
			00	8	12
			03	8	12
	or		50	8	12
			40	8	12
			46	8	12
			32	8	6
			37	8	6
			45	8	6
			47	8	6
			51	8	6
			57	8	6
			62	8	6
			66	8	6
			72	8	6
			79	8	6
			85	8	6

LIST OF

				Water Service.		Single or Double Main.	Size of Street Main.
				Full.	West Side.		
				48		S.	12
				48		S.	6
				36		S.	6
				48		S.	6
				45		S.	12
				48		S.	12
				47		S.	12
				30		S.	6
				34		S.	6
				35		S.	6
				45		S.	12
				46		S.	12
				68		S.	6
				72		S.	6
				45		S.	6
				37		S.	6
						S.	6
				20		S.	6
				28		S.	6
				24		S.	4
				51		S.	12
						S.	6
				111		S.	12
				60		S.	12
				58		S.	12
				76		S.	6
				43		S.	6
				49		S.	6
				79		S.	6
				51		S.	12
				50		S.	12
				48		S.	12
				48		S.	12
				44		S.	12
				35		S.	6
				72		S.	6
				40		S.	6
				45		S.	6
				53		S.	6
				51		S.	6
				80		S.	6
				81		S.	6
				58		S.	6
				58		S.	6
				54		S.	6
					78	S.	12
					78	S.	12
					60	S.	6
					65	S.	6
				34		S.	4
				33		S.	4
				33		S.	4
					104	S.	6
					98	S.	6
2053	Hunker and					S.	6
2054	Delos and Bidwell, n w cor.		21			S.	6
2055	Delos and Bellows, n e cor.		23			S.	6
2056	" " s. e. cor.		48			D.	6
2067	" " s. w. cor.		55			D.	6
	" " s. e. cor.		62			D.	6
	" " s. w. cor.			55		D.	6
	" " n e cor.			40		S.	6
	" " of Cleveland.			48		S.	12
	" " n. w. cor.			60		S.	4
	" " arie, n. e. cor.			60		S.	6
2064	George and Winslow, n e. cor.				91	S.	6

LIST OF H

No.	LOCATION.								
	and Endicott, s. w. cor.			44		S.			
	and Wheeler, n. w. cor.			32		S.			
	and Sixth, n. e. cor.		33			D.			
	on and Sixth, n. w. cor.		33			D.		12	
	on and Fifth, s. e. cor.		33			D.		12	
	on and Fourth, n. e. cor.		33			D.		12	
	and Cypress, n. w. cor.			43		S.			
	cor.			42		S.			
	s. cor.	41				D.		12	
	s. w. cor.			53		D.			
	and C., St. P., M. & O., n. e. cor.			52		D.			
	and C., St. P., M. & O., s. w. cor.			52		S.			
	Milton, n. e. cor.			40		S.			
	, n. w. cor.			50		S.			
	id Cypress, n. e. cor.			52		S.			
	nd Hester, n. w. cor.			55		S.			
	id Dunlap, n. e. cor.			30		S.			
	id Griggs, n. e. cor.			24		S.			
	n. w. cor.			28		S.			
	Buren, n. w. cor.			27		S.			
	w. cor.			24		S.			
	cor.			30		S.		12	
	s. w. cor.			20		S.			
	er and Princeton, n. w. cor.			22		S.			
	i, head of Vernon.			26		S.			
	n. e. cor.			30		S.			
	n. w. cor.			28		S.			
	n. w. cor.			28		S.			
	e cor.			30		S.			
	bet. Cedar and Minnesota, s. side		44			D.			
	bet. Minnesota and Robert, n. s.		45			D.			
	bet. Robert and Jackson, s. side.		46			D.			
	and Warsaw, n. w. cor.		32			S.		12	
	d Jefferson, n. w. cor.		31			S.			
	d Grace, s. w. cor.		30			S.			
	l Sibley, s. e. cor.		47			D.			
	l Pleasant, n. e. cor.			48		S.			
	w. cor.		33			D.			
	n. w. cor.		31			D.			
	Wheeler, n. w. cor.			27		S.			
	, Aldine, n. w. cor.			30		S.			
	and Tenth, n. w. cor.		27			D.			
	and Tenth, s. w. cor.		29			D.			
	ania and Park, n. w. cor.			72		S.		4	
	e. cor.		31			D.			
	yard.			87		S.			
				80		S.			
	n. sh		54			D.		12	
			49			D.		12	
			47			D.		12	
			45			D.		12	
	n. sh		46			D.		12	
	w. sh		68			S.			
			64			D.			
	west		68			D.			
	Alry			58		S.			
	west		58			D.		12	
2187	Broadway		48			D.		16	
2188			45			D.			
2189			45			D.			
2190			52			D.		12	
2191	Grand and			80		S.			
2192	Grand and Baldwin, n. e. cor.			81		S.			
2193	Curtis and Mt Hope, n. e. cor.					S.			
2194	Curtis and Harvard, n. w. cor.					S.			

LIST OF HYDRANTS.—Continued.

New hydrants placed during the year 1898 on low service, Lake Vadnais.....	5
New hydrants placed during the year 1898 on high service, reservoir.....	10
New hydrants placed during the year 1898 on high service, West Side.....	4
Total for the year	19
Note.—All hydrants are known as Matthews' patent.	

Twenty-six hydrants have been transferred from low service to high service.

DISTRICTS.	Double Steamers.	Single Steamers.	Total Number of Hydrants in each Dist.
Low service, Lake Phalen.....	16	107	123
Low service, Lake Vadnais.....	119	494	613
High service, reservoir.....	11	1,426	1,437
High service, West Side.....	.....	95	95
Total	146	2,122	2,268

The following hydrants are placed on private property. They are of the standard make, and can be used in case of fire: Northwestern Cordage Works, 4; W. A. Wood Harvester Works, 11; Northern Pacific shops, 3; Yoerg's brewery, 1.

TABLE NO. 18.

LIST OF STREET SPRINKLING HYDRANTS.

LOCATION.	MEASUREMENT OF VALVE FROM HYDRANT.
.....	10 feet.
.....	7 feet.
.....	6 feet.
.....	6 feet.
.....	5 feet.
.....	5 feet.
.....	6 feet.
.....	7 feet.
.....	6 feet.
.....	7 feet.
.....	6 feet.
.....	8 feet.
.....	5 feet.
.....	8 feet.
.....	5 feet.
.....	9 ft. e., 30 ft. s.
.....	3 feet.
.....	5 feet.
.....	In tunnel.
.....	7 feet.
.....	8 feet.
.....	8 feet.
.....	8 ft. n., 7 ft. e.
.....	35 ft. s., 7 ft. w.
.....	In tunnel.
.....	In tunnel.
.....	16 feet.
.....	4 feet.
.....	6 feet.
.....	11 feet.
.....	7 feet.
.....	8 feet.
.....	9 feet.
.....	31 feet.
.....	6 feet.
.....	10½ feet.
.....	31 ft. s., 33 ft. e.
.....	28 feet.
.....	10 feet.
.....	10 feet.
.....	8 feet.
.....	27 feet.
.....	10 feet.
.....	3 feet.
.....	9 feet.
.....	7½ feet.
.....	8 feet.
.....	8 feet.
.....	8 feet.
.....	7 feet.
.....	7 feet.
.....	8 feet.
.....	8 feet.
.....	8 feet.
.....	8½ feet.
.....	35 feet.
.....	6 feet.
57 Wacouta and Tenth	29 ft. s., 6 ft. e.
58 Arundel and Holly	10 feet.
59 Sherman and Smith.	48 ft. e., 7 ft. s.
60 Aurora	In tunnel.
61 Sixth	9 feet.
62 Eichenwald and Seventh.	9 feet.
63 Sinnen and Seventh	8 feet.
64 Reaney and Seventh	

LIST OF STREET SPRINKLING HYDRANTS.—Continued.

	10 feet.
	7 feet.
	8 feet.
	9 feet.
	8 feet.
	31 feet.
	9 feet.
	7 feet.
	28 feet.
	0 feet.
	7 feet.
	31 feet.
Ark Avenue.	30 feet.
	3 feet.
	30 feet.
	9 feet.
	4 feet.
	8 feet.
	8 feet.
	31 ft. s., 12 ft. e.
	7 feet.
Ark.	14 feet.
	7 feet.
	21 feet.
	35 feet.
	35 feet.
	11 feet.
	6 feet.
	7 feet.
	30 feet.
	31 feet.
	4 feet.
	7 feet.
	4 feet.
195 Mt. Hope and Prescott	75 ft. n., 7 ft. w
196 Geranium and Edgerton.	33 feet.
197 Jessamine and Greenbrier	33 feet.
198 East and Burr	30 feet.

LIST OF STREET SPRINKLING HYDRANTS.—Continued.

No.	LOCATION.	MEASUREMENT OF VALVE FROM HYDRANT.
266	Jessamine and Rice.....	8 feet.
267	Indiana and Rice.....	8 feet.
268	Earl and Cook.....	7 feet.
269	Earl and Case.....	6 feet.
270	Milton and Grand.....	45 ft. s., 9 ft. w.
271	Maple and Fifth.....	8 feet.
272	Park and Atwater.....	37 ft. s., 8 ft. e.
273	Park and Litchfield.....	37 ft. s., 6 ft. e.
274	Arundel and Thomas.....	7 feet.
275	Avon and Lincoln.....	4 ft. s., 7 ft. e.
276	Arundel and Aurora.....	6 ft. w., 6 ft. e.
277	St. Albans, 20 feet north of alley between Edmund and Thomas. .	178 ft. s., 5 ft. e.
278	St. Albans and Fuller.....	35 ft. s., 7 ft. e.
279	Maria and North.....	12 feet.
280	Hall and Winifred.....	11 feet.
281	Thomas and Farrington.....	7 feet.
282	Margaret and Cable.....	29 feet.
283	Mendota and Forest.....	9 feet.
284	Cherokee and Smith.....	28½ feet.
285	Cherokee and Stevens.....	8 feet.
286	Cherokee and Page.....	8 feet.
287	Cherokee and Winona.....	31 feet.
288	Mt. Airy and Linden.....	7½ feet.
289	Minnehaha and De Soto.....	6½ feet.
290	Winifred and Andrew.....	8 feet.
291	Stryker and Isabel.....	8 feet.
292	Milton and Iglehart.....	48 ft. s., 7 ft. e.
293	Front, west of Grotto.....	8 feet.
294	Chatsworth and Front.....	37 ft. s., 9 ft. e.

Number placed this year..... 3
Total placed to date..... 294

HYDRANTS.

- | | |
|---|--|
| 9 Double steamer hydrants, complete. | 2 Single steamer hydrants, without casing. |
| 6 Single steamer hydrants, complete. | 6 Sprinkling standpipe casings. |
| 1 Double steamer hydrant, without casing. | 6 Sprinkling standpipe casings, with crane attachment. |

GATES.

- | | |
|-----------------------------|------------------------------|
| 1 20-inch Gahvin gate. | 12 4-inch Coffin gates. |
| 1 16-inch Coffin gate. | 1 4-inch B. & M. gate, old. |
| 2 12-inch Coffin gates. | 5 4-inch Ludhow gates, old. |
| 5 8-inch Coffin gates. | 1 8-inch B. & M. gate, old. |
| 10 6-inch Coffin gates. | 1 3-inch R. D. W. gate, old. |
| 1 6-inch B. & M. gate, old. | 8 3-inch Gahvin gates. |

FITTINGS TO HYDRANTS AND STANDPIPES.

- | | |
|---|--|
| 2 D. S. hydrant casings. | 1 S. S. hydrant casing. |
| 2 hydrant nozzle reducers. | 12 stuffing boxes for sprinkling attachment. |
| 5 hydrant caps for gauges. | 11 2-inch top valves for standpipes. |
| 18 hydrant brass top nuts. | 8 2-inch top valves for standpipes, old. |
| 7 tops for D. S. hydrants. | 3 2-inch 45 deg. elbows. |
| 12 tops for S. S. hydrants. | 11 2-inch 90 deg. elbows, straight. |
| 22 large caps for hydrants. | 10 2-inch 90 deg. elbows, plain. |
| 22 small caps for hydrants. | 53 pieces 5 feet long 2½-inch hose for standpipes. |
| 1 set standard samples for hydrants. | 18 hydrant wrenches. |
| 46 rubber washers for D. S. hydrants. | 1 spanner. |
| 33 rubber washers for S. S. hydrants. | 8 socket wrenches for repairs. |
| 16 6-inch bases for hydrants. | 2 seat wrenches for repairs. |
| 9 4-inch bases for hydrants. | 5 Coe's wrenches. |
| 5 D. S. hydrant rods. | 3 S. wrenches. |
| 15 S. S. hydrant rods. | 2 wrenches for standpipes. |
| 10 stuffing boxes for D. S. hydrants. | 1 pair connectors. |
| 18 stuffing boxes for S. S. hydrants. | 1 pair plyers. |
| 2 brass ring valves for D. S. hydrants. | 1 ½-inch suction drip pump. |
| 11 brass ring valves for S. S. hydrants. | 1 No. 5 chain tong. |
| 2 brass seats for D. S. hydrants. | 2 sets of light tackle blocks with ¾-inch rope. |
| 11 brass seats for S. S. hydrants. | 2 ratchets. |
| 11 globe valves for D. S. hydrants. | 1 chain 6 feet long. |
| 24 globe valves for S. S. hydrants. | 2 boilers for steaming out frozen hydrants. |
| 8 brass ring valve nuts (for fire hydrants.) | 1 piece ¾-inch hose for steaming, 16 feet long. |
| 7 globe valve nuts (for fire hydrants.) | 16 caps for standpipe casings. |
| 11 revolving nuts (for fire hydrants.) | 2 14-inch flat files. |
| 6 5-inch extra brass nozzles. | 2 12-inch round files. |
| 17 3-inch extra brass nozzles. | 2 cold chisels. |
| 2 valve rods, 7 feet long. | 2 cape chisels. |
| 4 valve rods 17 feet long. | 1 box bolts. |
| 2 2-inch pipe drills. | 10 side pieces to hydrant drop boxes. |
| 2 2-inch pipe taps. | 22 top pieces to hydrant drop boxes. |
| 2 2-inch rimmers. | 12 extra top nuts. |
| 2 rimmer handles. | 2 pair 2-inch hose couplings, old. |
| 7 2-inch valves. | 2 wooden patterns for ring valves. |
| 15 2-inch stop and waste valves with wheels. | 3 extra brass rings for hydrant bases. |
| 22 2-inch stop and waste valves with stopcock tops. | 12 extra brass nuts for hydrant stuffing boxes. |
| 23 Holly hydrant rods. | |
| 1 hydrant drip box. | |
| 9 extra bases for standpipe casings. | |

MISCELLANEOUS OTHER MATERIAL.

AT OFFICE YARD.

6 manhole covers.	1 10-inch vitrified pipe.
84 cloth bags Austin cement.	1 6-inch vitrified wye.
29 paper sacks Mankato cement.	2 4-inch cast iron soil pipes.
$\frac{3}{4}$ barrel Portland cement.	80 lbs. $\frac{3}{4}$ -inch barbed wire.
15 heavy iron washers.	280 feet $\frac{3}{4}$ -inch wire rope, old.
125 bricks.	687 lbs. pig lead.
1 2 $\frac{1}{2}$ -inch wrought iron pipe, 8 feet long.	800 lbs. scrap lead.
160 lbs. yarn.	180 lbs. old solder.
1 pail plumbago grease.	117 lbs. tin.
3 lbs. dry plumbago.	777 lbs. old brass.
15 lbs. Italian hemp packing.	80 lbs. 60-penny nails.
$\frac{1}{2}$ barrel common salt.	100 lbs. 50-penny nails.
$\frac{1}{2}$ barrel rock salt.	240 lbs. 20-penny nails.
$\frac{3}{4}$ barrel Ebonite black paint.	255 lbs. 10-penny nails.
8 sidewalk cement tiles.	290 lbs. 8-penny nails.
	65 lbs. 8-penny finishing nails.

AT MIDWAY STATION.

200 lbs. lead.	25 lbs. hemp packing.
8 sacks cement.	

AT McCARRON STATION.

1,500 old bricks.	5 old stone steps.
1,100 pressed bricks.	33 pieces 36-inch sewer pipe.

AT VADNAIS LAKE STATION.

2,280 pressed bricks.	220 lbs. $\frac{3}{4}$ -inch rod iron.
11,000 sewer bricks.	$\frac{1}{4}$ barrel mineral paint.

AT BALDWIN LAKE STATION.

1,000 old bricks.	3 lbs. spikes.
-------------------	----------------

AT CENTERVILLE LAKE STATION

1,600 bricks.	6 granite monuments.
300 drain tiles, 1 foot long.	1 keg spikes.
15 pieces 6-inch sewer pipe.	4 sacks Mankato cement.
6 pieces 4-inch sewer pipe.	

OFFICE YARD.

STABLE AND SHOP.

4 horses.	1 sample 42-inch wooden pipe.
2 light trucks.	1 8-inch rubber belt 40 feet long.
2 buggies.	2 tape lines.
2 light bob sleighs.	3 spirit levels.
2 cutters.	1 work bench with 2 vices.
4 sets single harness.	1 anvil.
3 horse blankets.	2 log hooks.
23 pairs bedding blankets.	6 drag forks.
4 robes.	1 peavy.
2 manure forks.	3 pairs of grab tongs.
Quantity feed for horses.	1 pair of ice tongs.
2 farmers' kettles.	1 $\frac{3}{4}$ -inch hose for washing buggies.

SERVICES.

672 pounds 2-inch lead pipe.	200 feet connecting wire.
268 pounds 1½-inch lead pipe.	2 coils of fuse.
245 pounds 1½-inch lead pipe, old.	½ keg blasting powder.
290 pounds 1-inch lead pipe.	25 dynamite caps.
664 pounds ¾-inch lead pipe.	25 pieces blasting timbers.
553 pounds ⅝-inch lead pipe.	9 blasting chains.
2 pipes with faucets, 5 feet long.	1 solder iron.
2 Fuller faucets.	2 solder pots.
3 1½-inch stop and waste valves, with wheels.	3 smaller solder molds.
3 1¼-inch stop and waste valves, with wheels.	2 gasoline furnaces.
11 1-inch stop and waste valves, Dwyer patent.	1 hand force pump, old.
85 ¾-inch stop and waste valves, B. & M.	1 1-inch force pump.
60 ⅝-inch stop and waste valves, Dwyer patent.	49 feet 1-inch hose.
1 2-inch check valve.	65 feet ¾-inch hose.
11 1-inch corporation cocks.	1 pipe cutting machine for ½-inch to 2-inch.
25 ¾-inch corporation cocks.	3 Mueller tapping machines for ½-inch to 1-inch.
143 ⅝-inch corporation cocks.	2 kits plumber's tools.
22 ½-inch stop and waste cocks, B. & M.	1 tool box.
86 ⅝-inch stop and waste cocks, B. & M.	8 folding rods for turning on and off.
19 ¾-inch stop and waste cocks, Dwyer patent.	6 straight rods for turning on and off.
26 ½-inch corporation cocks.	2 pipe rimmer handles.
8 1½-inch stop and waste valves with stopcock tops.	2 2-inch taps.
8 1¼-inch stop and waste valves with stopcock tops.	1 1½-inch tap.
1 lot samples of stop and waste cocks.	1 1¼-inch tap.
1 lot samples corporation cocks.	1 1-inch tap.
1 lot small pipe fittings, old.	1 ¾-inch tap.
8 stop boxes without covers, Dwyer patent.	1 ½-inch tap.
15 extra stop box bases, Dwyer patent.	2 ⅝-inch taps.
6 middle stems to stop boxes, B. & M.	1 2-inch rimmer.
46 plugs from ½-inch to 2-inch.	1 1½-inch rimmer.
145 Dwyer patent stop boxes, complete	1 1¼-inch rimmer.
8 extra castings for stop box covers.	1 1-inch rimmer.
212 brass bolts for stop box covers.	2 2-inch drills.
1 lot goose necks ½-inch to 1-inch for corporation cocks.	2 1½-inch drills.
3 tunneling bars.	1 1-inch drill.
9 shovels.	1 ¾-inch drill.
3 dirt rammers.	1 ½-inch drill.
2 asphalt axes.	1 ⅝-inch drill.
2 connection drills.	1 ¼-inch drill.
9 drill hole scrapers.	1 extra 13-16-inch drill.
1 drill hole pump.	1 extra 15-16-inch drill.
7 sand augers.	1 pair callipers.
2 sand scoops.	1 ball face hammer.
10 sand scoop and auger handles.	1 draw knife.
1 electric battery.	1 hand axe.
	1 monkey wrench.
	1 Stillson wrench.
	2 valve rods.
	50 feet ½-inch tin pipe for thawing.
	4 poles for stop boxes.
	2 gasoline furnaces.
	1 windlass for sand rock tunnels.
	1 tap handle.
	1 2-inch solder nipple.
	1 2½-inch solder nipple.
	1 1¼-inch solder nipple.
	1 grab rod for stop boxes.

MIDWAY STATION.

GATES.

1 6-inch gate box, complete.
1 valve rod.

3 gate wrenches.

HYDRANTS.

1 S. Mathew hydrant.
6 globe valves.
1 ring valve.
1 valve seat.
1 stuffing box.
1 revolving nut.

3 hydrant wrenches.
1 seat wrench.
2 monkey wrenches.
4 standpipe wrenches.
2 files 14 inches long.
1 rasp, 14 inches long.

PIPE-LAYING TOOLS.

1 pick.
1 set tackle blocks.
1 dirt scraper.
1 3-legged derrick.
1 wheelbarrow.
2 16-pound sledges.
3 chains, 6 feet long.
1 striking hammer.
1 pipe rammer.
1 tunneling bar.
1 caulking hammer.

2 yarning tools.
5 caulking sets.
6 diamond points.
1 cutting chisel.
1 cold chisel.
1 lead furnace on wheels.
1 lead pot on furnace.
2 lead ladles.
3 cape chisels.
2 pairs set tongs.
1 crowbar.

CONNECTION STOCK AND TOOLS.

3 1-inch corporation cocks.
10 $\frac{3}{4}$ -inch corporation cocks.
7 $\frac{1}{2}$ -inch corporation cocks.
7 1-inch stop and waste cocks.
8 $\frac{3}{4}$ -inch stop and waste cocks.
1 stop cock rod.

5 stop cock poles.
2 faucets with 3 feet pipe.
15 brass nipples, $\frac{3}{4}$ -inch to 1 $\frac{1}{2}$ -inch.
1 pair $\frac{3}{4}$ -inch pipe tongs.
1 pair plyers.

STABLE AND MISCELLANEOUS.

1 truck.
1 garden hose, 50 feet long.
1 grindstone.
25 feet 1-inch rope.
3 lanterns.
1 work bench with pipe vise.
1 spirit level.
1 buck saw.

1 handsaw.
1 mason's trowel.
2 small augers.
1 row boat and 2 oars.
1 scythe.
2 spring wagons.
1 top buggy.

HIGH SERVICE RESERVOIR.

DWELLING.

4 chairs.
1 rocker.
1 rug, 7x9 feet.
1 table.
1 screen door.
3 window shades.
2 storm doors.
2 scythes.
4 cellar storm windows.

1 grindstone.
2 gate wrenches.
1 air vent rod.
1 stop wrench for valves.
2 sets sprinkling hose
1 spade.
3 rakes.
1 sickle.
1 manure fork.

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12 storm windows.
8 shovels.
2 picks.
1 lawn mower.
8 scythe stones.
10 window screens.

1 coal stove with 6 pieces stove pipe.
1 paint brush.
60 feet $\frac{1}{2}$ -inch rope.
1 16-pound sledge hammer.
2 mortar hoes.

SHED.

1 pick.
5 shovels.
1 sledge.
2 lagging caps.
2 grip hoes.
1 wheelbarrow.
1 chain, 9 feet long.
6 $1\frac{1}{2}$ -inch pipes, 6 feet long.
10 steel brooms.

5 sections $1\frac{1}{2}$ -inch hose, 50 feet long.
3 hose nozzles.
4 floating rafts.
1 1-gallon oil can.
1 bundle shingles.
1 monkey wrench.
14 corn brooms.
150 feet $\frac{1}{2}$ -inch rope.
20 pounds nails.

McCARRON LAKE PUMPING STATION.

1 vise.
1 set of screw dies and taps.
1 set of screw dies and taps, from $\frac{1}{4}$ -inch to 1-inch.
1 set of dies and tap, from 1-16-inch to $\frac{1}{4}$ -inch.
1 set of pipe dies and taps, from $\frac{1}{4}$ -inch to $\frac{3}{4}$ -inch.
1 set of pipe dies and taps, from 1-inch to 2-inch.
2 pipe cutters.
1 pair 2-inch pipe tongs.
1 24-inch pipe wrench.
1 12-inch pipe wrench.
1 22-inch Coe's wrench.
1 14-inch Coe's wrench.
1 8-inch Coe's wrench.
1 6-inch Coe's wrench.
1 portable blacksmith forge.
1 anvil.
1 sledge hammer.
2 hand hammers.
1 soft hammer.
6 files.
2 saws.
1 axe.
1 hatchet.
1 $1\frac{1}{2}$ -ton chain block.
1 3-ton chain block.
1 set steel wrenches, for Nos. 1, 2 and 3 pumps.
1 24-inch square.
6 chairs.
4 ladders.
1 good cupboard.
1 oil and waste cupboard.
1 work bench.
5 cuspidors.
1 ratchet and drills.
1 ratchet, brace and bit.
3 tack screws.
1 draw-knife.
1 planer.
6 chisels.
1 Edison's recording gauge.
1 Thompson indicator.
1 lot of old pipe and fittings.

50 feet of $1\frac{1}{4}$ -inch rubber hose.
50 feet of $\frac{3}{4}$ -inch rubber hose.
3 oil tanks.
3 $\frac{1}{4}$ -gal. oil cans.
2 3-quart oil cans.
4 hand oilers.
1 12-inch level.
2 lawn mowers.
20 bars soap.
35 cans of lye.
20 boxes matches.
1 steel coal wheelbarrow.
3 coal scoops.
2 coal hammers.
1 Fairbanks 6-ton scale.
1 Fairbanks 1,000-lb. scale.
1 grindstone.
3 large tubular lanterns.
4 small lanterns.
1 clock.
1 writing desk.
65 electric lamps.
2 shovels.
1 water pail.
1 Concord buggy.
1 cutler.
1 robe.
1 regrinding valve machine, from $\frac{1}{4}$ -inch to 2-inch.
1 old 54-inch boiler front.
1 stove with pipe at terminal chamber.
1 manhole wrench.
1 lot of old castings, pipes, valve and fittings, from $1\frac{1}{2}$ -million pump.
1 set of old rubber valves, from 0-million pump.
1 set brass valves, from 3-million pump.
1 air chamber.
412,474 lbs. Youghiogheny coal.
1 cord wood.
1 cord edgings.
10 gallons cylinder oil.
35 gallons engine oil.
30 gallons kerosene oil.
18 lbs. waste.

2 gate wrenches.
 3 steel brooms.
 1 block and rope, $\frac{3}{4}$ -inch.
 2 brooms.
 1 pair of rubber boots.

10 lbs. piston rod packing.
 1 large truck for hauling 20 to 36-inch pipes (4 wheeled.)
 1 large truck for hauling 12 to 20-inch pipes (2-wheeled).

WEST SIDE PUMPING STATION.

1 vise.
 1 24-inch pipe wrench.
 1 14-inch pipe wrench.
 1 hand saw.
 1 axe.
 1 hatchet.
 3 oil tanks.
 1 1,000-lb. Fairbanks scale.
 1 work bench.
 2 coal shovels.
 1 wardrobe.
 1 clock.
 3 large tubular lanterns.
 1 writing desk.
 2 chairs.
 1 gate wrench.
 1 steel coal wheelbarrow.
 1 cuspidor.
 1 step ladder.

1 set engineer's 5-piece brass hand
 ollers.
 2 $\frac{1}{2}$ -gal. measures.
 2 hand ollers.
 1 set wrenches for pumps.
 1 set fire tools.
 25 feet $\frac{3}{4}$ -inch steam hose.
 100 feet of $\frac{3}{4}$ -inch garden hose.
 1 lawn mower.
 1 hay rake.
 1 4-inch boiler flue cleaner.
 25 feet of 1-inch hose.
 44,000 lbs. coal.
 7 gallons cylinder oil.
 37 gallons engine oil.
 18 gallons kerosene oil.
 10 lbs. piston rod packing.
 5 lbs. waste.

VADNAIS LAKE PUMPING STATION.

GATE HOUSE.

4 storm windows.
 4 window screens.
 2 brooms.
 1 steel broom.
 1 shovel.
 1 galvanized pail.
 1 ice chisel.

4 steel traps.
 2 gate wrenches.
 1 gate lock and key.
 1 boat chain.
 1 row boat.
 1 pair oars.
 1 pair rubber boots.

DWELLING HOUSE.

15 storm windows.
 15 window screens.
 2 screen doors.
 1 thermometer.
 1 hand pump for cistern.

1 kalsomine brush.
 2 storm doors.
 2 ventilators for chimneys.
 1 lawn mower.
 100 feet $\frac{3}{4}$ -inch garden hose with reel.

PUMPING STATION.

1 heating stove.
 1 8-day clock.
 2 S. wrenches.
 4 monkey wrenches.
 2 Stilson pipe wrenches.
 2 cold chisels.
 4 files.
 2 hammers.
 2 hand lanterns.
 5 large globe lanterns.
 1 spirit level.
 1 paint brush.
 1 hand saw.
 1 wooden rod with ball joint for flue.

1 steel coal wheelbarrow.
 1 grindstone.
 1 axe.
 1 grub hoe.
 1 brush hook.
 1 draw knife.
 1 writing desk.
 2 chairs.
 1 cuspidor.
 1 iron block plane.
 1 tray brass oiler.
 3 steel ollers.
 1 brace and bit.
 1 belt punch and rivet set.

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1 3-inch steel flue cleaner.	1 1384 scale.
1 cleaner.	1 Fairbanks platform scale.
3 50-gallon oil tanks.	1 No. 4 centrifugal pump.
1 coal pick.	1 scrub brush.
2 scoop shovels.	1 mop.
50 feet 1-inch rubber hose and nozzle.	10 centers for Pleasant lake conduit.
50 feet 1½-inch rubber hose and nozzle.	5 water barrels.
2 oil cans.	1 level board 12 feet long.
1 automatic oil tilter.	1 pile driver, complete, with 1,000-lb. hammer.
1 step ladder.	1 sheeting driver, complete.
1 shovel.	23,200 lbs. coal.
1 pick.	50 gallons cylinder oil.
1 vise.	25 gallons engine oil.

BALDWIN LAKE PUMPING STATION.

1 old smokestack, 34 inches by 45 feet.	3 pairs long rubber boots.
4 wheelbarrows.	1 flatboat, 4x18 feet.
3 short handle shovels.	1 snow shovel.
2 long handle shovels.	1 hand axe.
2 crowbars.	2 grate bars.
2 ice chisels.	2 pairs truck wheels.
1 crosscut saw.	2 long boiler braces.
1 pick.	2 short boiler braces.
1 coal shovel.	1 large lantern.
3 mauls.	2 small lanterns.
20 wrenches to pump.	1 lead furnace.
1 ¾-inch ship auger.	1 gate wrench, 5 feet long.
	17 cords oak wood.

PLEASANT LAKE GATE HOUSE.

1 boat, 4x16 feet.	1 ladder, 14 feet long.
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CENTERVILLE PUMPING STATION.

1 vise.	25 feet of old 1½-inch rubber hose.
1 pair pipe tongs.	1 pair rubber boots.
1 24-inch pipe wrench.	5 10-inch brass vacuum gauges.
1 12-inch pipe wrench.	1 ¾-inch auger.
1 24-inch Coe's wrench.	2 crowbars.
1 12-inch Coe's wrench.	6 chisels.
1 8-inch Coe's wrench.	4 files.
1 8-inch S wrench.	2 caulking tools.
1 hand hammer.	2 steel hand rollers.
1 coal hammer.	1 No. 3 Black boiler feed pump, belongs to Baldwin Lake Station.
2 saws.	1 box stove, for wood, and 60 feet stovepipe.
1 hatchet.	1 writing desk.
1 axe.	1 set steel wrenches.
3 oil tanks.	1 lantern cupboard.
2 1-quart cans.	2 gate wrenches.
2 3-quart cans.	1 hand pushcar.
1 steel coal wheelbarrow.	200 feet light railroad track.
2 coal scoops.	1 forge hand pump.
1 grindstone.	1 wood wheelbarrow.
6 large lanterns.	2 cuspidors.
3 small lanterns.	275 cords oak wood.
3 bracket lamps.	97 cords soft wood.
1 clock.	28,000 lbs. Youghiogheny coal.
1 draw-knife.	25 gallons cylinder oil.
1 ratchet, brace and bit.	25 gallons engine oil.
1 chain.	10 gallons kerosene oil.
1 2-ton chain block.	70 lbs. waste.
1 4-inch steam flue cleaner.	12 lbs. packing.
1 4-inch boiler flue scraper.	
50 feet of new 1½-inch rubber hose.	

CENTERVILLE LAKE TOOL HOUSE.

2 tool boxes.	1 spirit level.
2 ratchet wrenches.	1 50 feet tape.
6 brace wrenches.	1 cross-cut saw.
6 hand wrenches.	1 2-inch auger.
1 driving maul.	1 hand pump.
1 coopering maul.	1 axe.
4 stave setters.	1 caulking hammer.
3 hammers.	1 claw hammer.
4 hoop clampers.	1 sledge hammer.
2 stave chisels.	1 striking hammer.
2 hoop drivers.	1 set caulking tools.
$\frac{1}{2}$ keg of clips for end of staves.	1 cant hook.
2 kegs of steel shoes for bands.	5 picks.
200 $\frac{1}{2}$ -inch old steel bands for wooden conduit.	1 plow.
300 feet condemned staves for wooden conduit.	2 slush scrapers.
6 long handle shovels, square pointed.	11 wheelbarrows.
6 long handle shovels, round pointed.	1 post auger.
14 short handle shovels, round pointed.	2 long handle rakes.
3 short handle shovels, square pointed.	1 boat and 2 oars.
	1 chariot for inspection of conduits.
	1 pile driver, complete, with a 500-lb. hammer.

METER DEPARTMENT.

1 kit plumber's tools.	1 sheet cardboard packing.
2 plumber's furnaces.	3 large meter boxes.
2 tinner's solder irons.	12 small meter boxes.
9 pipe wrenches.	1 lot miscellaneous fittings, $\frac{1}{4}$ -inch to 4-inch.
7 S. wrenches.	2 sets Empire inside gearing.
2 machinist hammers.	1 doz. Empire gear wheels.
1 rivet hammer.	14 sets Crown inside gearing.
14 files.	3 doz. Crown gear wheels.
6 screw drivers.	15 $\frac{5}{8}$ Crown covers.
3 pair plyers.	5 $\frac{5}{8}$ Crown cylinders.
1 small chisel.	4 $\frac{5}{8}$ Crown pistons.
3 cold chisels.	2 $\frac{5}{8}$ Crown straight reading dials.
2 small punches.	1 1-inch Crown straight reading dial.
2 callipers.	20 sets Hersey inside gearing.
1 divider.	2 do. Hersey gear wheels.
1 breast drill.	3 $\frac{5}{8}$ Hersey covers, complete.
15 twist drills, 1-16-inch to $\frac{1}{2}$ -inch.	1 doz. $\frac{5}{8}$ Thomson "B" gear wheels.
1 set stock and dies, $\frac{1}{8}$ -inch to $\frac{1}{2}$ -inch.	1 doz. $\frac{5}{8}$ Thomson "B" eccentric gears.
2 compass saws.	1 1-inch Thomson "B" piston and chamber.
1 hack saw.	2 $\frac{5}{8}$ -inch Thomson "B" discs.
6 hack saw blades.	4 $\frac{3}{4}$ -inch Thomson "B" discs.
4 small sheet bars.	1 1-inch Thomson "E" disc.
1 gasket cutter.	1 $\frac{5}{8}$ -inch Trident disc.
4 pressure gauges.	10 Trident gear wheels.
2 hand saws.	1 $\frac{5}{8}$ -inch Trident bottom.
1 2-foot rule.	3 $\frac{5}{8}$ -inch Pittsburg bottom castings.
1 carpenter's plane.	1 $\frac{5}{8}$ -inch Pittsburg inside gearing.
1 saw set.	5 $\frac{5}{8}$ -inch Pittsburg discs.
1 carpenter's hammer.	1 1 $\frac{1}{2}$ -inch Pittsburg disc.
4 wood chisels.	5 Westinghouse inside gearing.
1 50-foot tape.	5 doz. Pittsburg gear wheels.
1 2-foot square.	14 Worthington plungers.
2 pounds sealing wax.	12 Worthington rings.
2 sealing stamps.	
1 Fairbanks 1,200-pound scale.	
1 10 cubic foot testing tank.	

REPORT OF CITY ENGINEER.

OFFICE OF THE CITY ENGINEER.
ST. PAUL, MINN., Jan. 1, 1899.

To the Board of Water Commissioners,

GENTLEMEN: I submit herewith my annual report of work under charge of the Engineering Department during the year ending Dec. 31. 1898, with tables relative to the water supply and water consumption, and the cost of pumping at the various stations.

CONTRACT WORK.

The contract work under charge of the Engineering Department during the year 1898 has been unusually small, and is embraced in the following statement. Most of the items are for work let in 1897 and not fully completed until this year:

McCarron Lake, foundation stone for pumping engine, Minneapolis & Kettle River Sandstone Co., contractor.....	\$554.56
Venturi meter. Builders' Iron Foundry, contractor.....	1.151.75
McCarron Lake pumping engine, Edward P. Allis Co., contractors	26,814.33
McCarron Lake pumping engine, inspection, Robert W. Hunt & Co., contractors.....	850.00
McCarron Lake pumping station, boilers, John Kenny, contractor	1,223.00
Centerville engine house, Hennessy & Cox, contractors, estimates allowed.....	50.00
Centerville pumping engine, Edward P. Allis Co., contractor, estimates allowed.....	350.00

SURVEYS AND FIELD WORK.

A considerable amount of work was done to the outlet of Baldwin Lake in setting and reading gauges, taking water elevations, obtaining evidence for the suit for damages for flooding haylands, brought by farmers owning property about Rice Lake, and the results obtained corroborated the previous work done, as showing that in reality no cause of action existed. As the suits, however, have been satisfactorily settled on a

In accordance with the contract, the engine was required, during a running test of seventy-two hours, to develop a duty of 130,000,000 foot pounds per thousand pounds of steam, and in case the engine shall fail to develop said duty, through a lack of efficiency of the engine, a deduction will be made from the contract price of \$1,700 for each one million foot pounds, which the duty falls below 130,000,000; but in case the engine exceeds, during the seventy-two-hour test, an average duty of 130,000,000 foot pounds per thousand pounds of steam, the contractor will receive a bonus for each million foot pounds the duty exceeds 130,000,000, in the ratio of \$600 for each 1,000,000 foot pounds which the duty comes above 130,000,000; provided, however, that the maximum bonus allowed shall not exceed \$6,000.

The official test of the engine was made under the direction of Robert W. Hunt & Co., of Chicago, commencing at 7 p. m., Nov. 13, 1898, and continuing seventy-two hours, and they have submitted a very carefully prepared detailed report. The contractor was represented by Mr. Arthur West, and the city by myself and part of the Engineering Department, who assisted in taking the readings. I herewith submit as part of my report the following extract from the official report of the experts, in order to make a permanent record of easy reference.

DESCRIPTION OF ENGINE.

"The engine is of the vertical, triple expansion, crank and fly-wheel type, with single acting outside packed plunger pumps, all of the usual Allis design. The three pump barrels are placed beneath and directly in line with the steam cylinders, and the plungers connected to the steam cross-heads by means of four distance rods. One end of the main bed plates is supported on the pump chambers, the other end being carried on a masonry pier. The shaft has three cranks set at angles of 120°, there being two fly-wheels on the shaft.

There are 840 3½-inch rubber valves in the pumps, the valves being mounted on cages. Surface condenser is located in the suction pipe. Suction pipe is 30 inches diameter; discharge pipe, 24 inches diameter. The principal dimensions of the engine are as follows:

Number of cylinders.....	3
Diameter of H. P. cylinder, inches.....	21.5
Diameter of I. P. cylinder, inches.....	38
Diameter of L. P. cylinders, inches.....	56
Diameter of piston rods, inches.....	3.875
Number of plungers.....	3
Diameter of plungers, inches.....	24.75
Stroke of plungers and pistons, inches.....	42
Plunger displacement, cubic feet.....	11.6936
Plunger displacement, per revolution, cubic feet.....	35.0809
Plunger displacement, per revolution, U. S. gallons.....	262.42
Clearance in H. P. cylinder, per cent.....	2

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RESULTS OF DUTY TRIAL.

1. Duration of trial in hours.....	72
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AVERAGE PRESSURES.

2. Steam pressure at engine by gauge, pounds.....	135.7
3. Steam pressure at engine corrected, pounds.....	127.9
4. Pressure in first receiver by gauge, pounds.....	31.8
5. Pressure in second receiver by gauge, pounds.....	.28
6. Vacuum by gauge.....	12.83
7. Discharge head on pumps, feet.....	146.638
8. Discharge head on pumps, pounds.....	63.49
9. Suction head on pumps, feet.....	.652
10. Total head on pumps, feet.....	146.586
11. Total head on pumps, pounds.....	63.47

AVERAGE TEMPERATURES.

12. Temperature of water pumped, degrees, Fahrenheit.....	45
13. Temperature of condensed steam, degrees, Fahrenheit.....	61

CONDENSED STEAM.

14. Total condensed steam, pounds.....	219,601.5
15. Total condensed jacket steam, pounds.....	38,443.5
16. Total condensed steam, pounds.....	258,045
17. Percentage of jacket steam.....	14.9

COAL.

18. Total coal burned, pounds.....	34,072
19. Total ash, pounds.....	3,002
20. Total combustible.....	31,070
21. Percentage of ash.....	8.8

CAPACITY.

22. Revolutions in 72 hours.....	116,649
23. Average revolutions per minute.....	27.002
24. Weight of a cubic foot of water at 45° Fahrenheit, pounds	62.42
25. Pounds pumped in 72 hours (by weir).....	254,308,223
26. Gallons pumped in 24 hours (by weir).....	10,159,000
27. Gallons pumped in 24 hours (plunger displacement)..	10,203,676
28. Leakage around plungers, per cent.....	.19
29. Slip of valves, per cent.....	.25
30. Total slip and leakage, per cent.....	.44

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placement and weir measurement on the high service system, enabling us to keep a careful supervision over each system.

WATER CONSUMPTION.

The usual record has been kept of the water consumption during the year in each system, the results of which are shown in Table No. 1. The total amount of water used was 2,920,017,722 gallons, being an average of 8,000,000 gallons per day. This supply has been obtained from the following sources:

SOURCE.	Total.	Av. Daily Supply.
Watershed of Vadnais and tributary lakes...	634,772,636	1,739,105
From storage capacity, Vadnais Lake.....	502,370,000	1,376,346
Artesian wells at Vadnais Lake.....	816,776,403	2,237,743
Lake Phalen.....	181,893,683	498,339
Otter Lake.....	190,670,000	522,384
Centerville Lake and artesian wells.....	593,535,000	1,626,120
Totals	2,920,017,722	8,000,037

In the Vadnais Lake supply 634,772,636 represents the amount collected on the watershed. This year, owing to the improvements going on at Pleasant Lake, the storage capacity was drawn to the extent as shown above, but under ordinary conditions it would have been replenished from the Centerville Lake system.

In accordance with my recommendation in last year's report, and your subsequent instructions, an effort has been made to ascertain the actual amount of water per service and per capita in the residence districts, and from the results thus obtained to make an estimate of the amount of water actually used by private consumption, and approximately the amount used for public service and waste. To obtain these results a record of 1,185 metered services in different sections of the residence district was tabulated, and a census was also taken by the operating department of the number of inhabitants to each tap.

These results were turned over to the Engineering Department, and a careful analysis has been made. These tables are too large for publication, but the following condensed tables show the results which were obtained:

	Dayton's Bluff and Arlington Hill.	Midway District.	7th, 8th and 9th Wards.	Total.
Number of services.....	331	283	571	1,585
Number of people.....	1,676	1,293	2,915	5,884
Number of people per service	5.064	4.569	5.105	4.965
Average daily consumption, per service.....	84.18	118.31	192.88	140.06
Average daily consumption, per capita.....	16.63	25.78	36.44	28.22

January . .
February .
March . . .
April
May
June
July
August . . .
September
October . .
November
December

	Number of Services.	Daily Consumption Per Service, Gallons.
West St. Paul high service.....	110	562.05
Low service from Vadnais Lake.....	4,142	953.00
Low service from Phalen Lake.....	1,093	455.90
<hr/>		
Total low service.....	5,345	749.6
High service.....	8,626	462.5
<hr/>		
Total high and low service.....	13,971	572.6

These tables are interesting as showing not only the actual amount of water used per capita, but also showing the amount used in the different districts in accordance, in a large measure, with the class of buildings.

The results obtained from these 1,185 metered services agree very well with those of 1897 made on a smaller scale. While the per capita consumption is increased, so also is the recorded metered consumption per service, and the average consumption per service throughout the whole high service district.

TABLE NO. 2.
ESTIMATED DISTRIBUTION OF WATER CONSUMED ON THE HIGH
SERVICE SYSTEM IN 1898.

MONTH.	WATER USED FOR PUBLIC PURPOSES.		PROBABLE AMOUNT USED FOR DOMESTIC PURPOSES.		PROBABLE WASTE.		TOTAL AMOUNT OF WATER.	
	Sprinkling and Flush- ing of Streets.	Flushing of Mains— Waste from Reservoir.	Total.	Daily Per Service.	Total.	Daily Per Service.	Total.	Daily Per Service.
January.....			28,000,000	105	68,600,200	256	96,600,200	361
February....			27,000,000	114	60,387,000	250	87,387,000	364
March.....			25,000,000	95	69,552,900	260	94,552,900	359
April.....	3,280,000		26,000,000	102	68,956,000	266	98,236,000	380
May.....	16,120,000	2,800,000	38,000,000	144	71,598,000	268	125,518,400	470
June.....	18,730,000		33,000,000	128	76,686,000	266	128,396,000	496
July.....	26,435,000	2,800,000	63,000,000	236	70,630,300	264	159,865,300	598
August.....	23,302,000	4,500,000	62,000,000	232	63,592,000	238	153,365,700	574
September..	24,760,000		57,000,000	223	62,929,600	243	144,689,600	559
October.....	6,750,000		30,000,000	111	77,271,300	280	114,030,300	426
November...	4,100,000	20,000,000	25,000,000	97	86,623,100	335	135,723,100	524
December...			25,000,000	95	92,803,400	347	117,803,400	441
Total.....	123,486,000	30,100,000	439,000,000		869,609,800		1,456,168,200	
Average daily per service....				140		276		462

TABLE NO. 3.

DISTRIBUTION OF WATER CONSUMED ON HIGH AND LOW SERVICE,
1898.

MONTH.	WATER USED FOR PUBLIC PURPOSES.		WATER USED FOR DOMESTIC PURPOSES AND WASTE.		TOTAL CONSUMPTION.	
	Sprinkling and Flush- ing of Streets.	Flushing of Mains and Water from Reservoir	Total.	Daily Per Service.	Total.	Daily Per Service.

Table No. 2 gives the distribution of water consumption on the high service system, showing the amount used for public purposes, domestic purposes, probable waste, and the average daily consumption per service. These figures are based upon the average metered service consumption for the different months as obtained from the observations of 1898. While the results are only approximate, the table bears strong evidence that it fairly represents existing conditions, and that about sixty per cent of the water pumped into the distribution mains is wasted, and these figures compare closely with the results obtained in 1894 by an entirely different method of observation.

It is difficult to estimate how large a proportion of this waste is due to leaks in the distribution mains and how much in the service pipes, but the detailed tables of the metered services show a considerable number of leaks, increasing the consumption from four to thirty-five times the normal. These are, of course, repaired as soon as made apparent by the increase in the amount of the water bill, but in unmetered services they are left to run unless discovered by the inspector or they increase to such an extent as to become a nuisance.

Table No. 3 gives a distribution of the water used for public and domestic purposes on both high and low systems, and shows the amount used for sprinkling and flushing, domestic use and waste during each month of the year; also the average daily consumption per service for the whole city.

The city of St. Paul has always shown a low rate of water consump-

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		Cost of Raising 1,000,000 Gal. One Foot.
Salaries for 1898.....	\$1,320.00	\$0.27984
Fuel	434.29	0.09207
Waste, oil and repairs.....	64.90	0.01376
Totals	\$1,819.19	0.38567

VADNAIS LAKE PUMPING STATION.

Amount of water pumped during 1898, gallons.....	816,776,403
Amount of fuel consumed, pounds.....	589,320
Average duty during the year.....	49.100,000

As the pump does not fill within from eleven to twelve per cent, piston displacement has been used in figuring the work done on the suction side in obtaining the above duty.

		Cost of Raising 1,000,000 Gal. One Foot.
Salaries for 1898.....	\$990.00	\$0.030985
Fuel	1,051.89	0.032922
Waste, oil and repairs.....	128.02	0.004006
Total	\$2,169.91	\$0.067913

CENTERVILLE PUMPING STATION.

Amount of water pumped during 1898, gallons.....	532,430,000
--	-------------

On account of insufficient data in regard to the suction lift of the pump, it is not practicable to give the duty or the cost per million gallons per foot.

PRECIPITATION, ST. PAUL, 1898.

In accordance with the report of P. F. Lyons, observer of the United States Weather Bureau, the total amount of precipitation at St. Paul for the year ending Dec. 31, 1898, was 25.34 inches. The average precipitation in accordance with our previous tabulation is 27.5 inches. The precipitation for 1898 is therefore a little more than two inches below the normal. The record by months is as follows:

January .....	.04	July	1.94
February	1.69	August	3.93
March	1.96	September .....	.90
April	1.22	October	5.81
May	3.40	November	1.59
June	2.71	December .....	.15

BALD EAGLE LAKE.

Nothing has been done during the past year relative to any condemnation proceedings to acquire the necessary land to open a ditch or canal between Otter and Bald Eagle Lakes, so that the overflow of Bald Eagle

OF THE CITY OF ST. PAUL, FOR 1898.

Lake in the spring might be brought directly into the Vadnais Lake system, as recommended in my last report. I would again recommend the completion of the surveys about Centerville and Peltier Lakes the necessary surveys and maps be made to secure as soon as practicable the condemnation of lands required for this purpose. It is not contemplated this scheme to draw down Bald Eagle Lake below the normal, but merely to utilize the overflow in connection with Otter Lake.

There is no doubt that this would prove an economical expenditure by saving the cost of pumping from Centerville Lake system.

Respectfully submitted,

L. W. RUNDLETT
City Engineer

CHIEF ENGINEER'S REPORT.

ST. PAUL, Dec. 31, 1898.

To the Honorable President and Members of Board of Water Commissioners,

GENTLEMEN: I herewith submit my fourteenth annual report of the operation of the four pumping stations for the year 1898:

McCarron Lake station has been in continual operation, and a considerable amount of work was done by taking out small engine and foundation and replacing it by the new ten-million pump; by changing all steam and water pipe connections. The new ten-million pump has been running seventy-three days and is giving perfect satisfaction. It was stopped last month for the purpose of being painted.

West Side station has been in continual operation, and has not required any repairing.

Vadnais Lake station has been in operation 190 days.

Centerville Lake station has been in operation forty-three days.

The following tabulated record shows the operation of the different pumping stations:

McCarron Lake Station—	
Total gallons pumped.....	1,456,168,200
Daily average gallons pumped.....	3,989,501
Total pounds of coal used.....	2,205,128
Daily average coal used.....	5,892
Daily increase since 1897 (gallons).....	482,301
West Side Station—	
Total number of gallons pumped.....	22,668,660
Daily average of gallons pumped.....	61,654
Total pounds of coal used.....	269,200
Daily average coal used.....	742
Daily increase since 1897 (gallons).....	17,767
Vadnais Lake Station—	
Total gallons pumped.....	924,765,600
Daily average gallons pumped.....	4,509,561
Total pounds of coal used.....	589,300
Daily average coal used.....	2,887

Respectfully submitted,

MARTIN FEIST,

Chief Engineer.

**ST. PAUL WATER WORKS PUMPING STATION, VADNAIS LAKE.
ENGINEER'S REPORT FOR THE YEAR ENDING DEC. 31, 1898.**

MONTHS, 1898.	No. of Hours Pumped	Number of Revolutions	Number of Gallons Pumped.	Daily Average Gallons Pumped.	Total Coal Used.	Daily Average Coal.
May	490	1,104,800	97,222,400	4,861,120	58,600	2.830
June	604	1,551,500	136,532,000	4,551,066	86,120	2.870
July	685	1,606,900	141,407,200	4,561,522	87,900	2.835
August	587	1,385,000	121,832,800	3,933,316	74,700	2.479
September	655	1,545,900	136,039,200	4,534,640	84,600	2.820
October	604	1,655,400	145,675,200	4,690,200	93,400	3.013
November	542	1,315,100	115,728,800	3,857,628	65,100	2.836
December	144	343,500	30,228,000	5,038,000	20,900	3.483
Totals	4,561	10,508,700	924,765,600	4,509,561	589,300	2.887

Total gallons pumped.....	\$924,765,600
Daily average gallons pumped.....	4,509,561
Total pounds of coal used.....	589,300
Daily average coal used.....	2,887

**HERMAN GEISLER,
Engineer.**

ST. PAUL WATER WORKS PUMPING STATION, CENTERVILLE LAKE.

ENGINEER'S REPORT FOR THE YEAR ENDING DEC. 31, 1898.

MONTHS, 1898.	Number of Hours Pumped.	Number of Revolu- tions.	Number of Gallons Pumped.	Daily Average Pumped.	Total Cords Wood.	Average Daily Wood.
September	198½	354,100	128,908,200	15,000,000	43½	5
October	615½	995,700	360,443,400	14,066,064	86½	3½
November	197	287,800	104,183,600	18,022,950	30½	4
Totals	1,011½	1,639,600	593,535,200	14,029,638	160½	4

Total gallons pumped.....	593,535,200
Daily average gallons pumped.....	14,029,638
Total cords wood burned.....	160½
Daily average wood used.....	4

J. ABRESCH,
Engineer.

ST. PAUL WATER WORKS PUMPING STATION, WEST SIDE.
ENGINEER'S REPORT FOR THE YEAR ENDING DEC. 31, 1898.

MONTHS, 1898.	No. of Hours Pumped	Number of Revolutions.	Total Number of Gallons Pumped.	Daily Average Gallons Pumped.	Total Pounds of Coal Used.	Daily Average Coal Used.
January	13.00	32,890	592,020	19,097	17,250	556
February	13.24	34,680	624,240	22,294	16,000	571
March	16.46	43,790	788,220	26,426	16,800	542
April	25.12	66,510	1,097,180	36,572	17,500	583
May	50.10	128,490	2,312,820	74,607	25,100	809
June	50.30	129,440	2,329,920	77,664	23,400	780
July	71.25	184,590	3,322,620	107,181	29,100	939
August	57.25	148,570	2,674,260	86,427	25,300	816
September	71.15	183,500	3,303,000	110,100	29,450	981
October	57.25	145,740	2,623,320	84,623	25,800	803
November	46.40	117,710	2,118,780	70,626	24,100	803
December	16.45	43,460	782,280	26,324	19,400	626
Totals	490	1,259,370	22,668,660	61,654	260,200	742
Total number of gallons pumped.....					22,668,660	
Daily average gallons pumped.....					61,654	
Total pounds of coal used.....					260,200	
Daily average coal used.....					742	
Daily increase since 1897.....					17,769	

JOE DOERR,
Engineer.

REPORT OF CITY TREASURER.

OFFICE OF THE CITY TREASURER,
ST. PAUL, Jan. 13, 1899.

To the Honorable Board of Water Commissioners,

GENTLEMEN: I have the honor to submit the following report of the receipts and disbursements of the Water Department and Water Department sinking funds for the year 1898:

WATER DEPARTMENT.

CR.

By balance Jan. 1, 1898.....		\$14,900.48
By cash collections.....	•	194,038.56
By frontage tax.....		103,927.35

DR.

To cash, city orders, sundries.....	\$188,834.26	
To cash, city orders, interest.....	114,200.00	
To balance Jan. 1, 1899.....	9,832.13	
	<hr/>	<hr/>
Totals	\$312,866.39	\$312,866.39

WATER DEPARTMENT SINKING FUND.

CR.

By balance Jan. 1, 1898.....		\$7,525.08
By cash invested in bonds and certificates.....		372,048.72

DR.

To tax levy certificates.....	\$119,500.00	
To redemption of bonds.....	260,000.00	
To interest per city comptroller.....	48.86	
To balance Jan. 1, 1899.....	24.94	
	<hr/>	<hr/>
Totals	\$379,573.80	\$379,573.80

Respectfully submitted,

C. L. HORST,
City Treasurer.

